This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

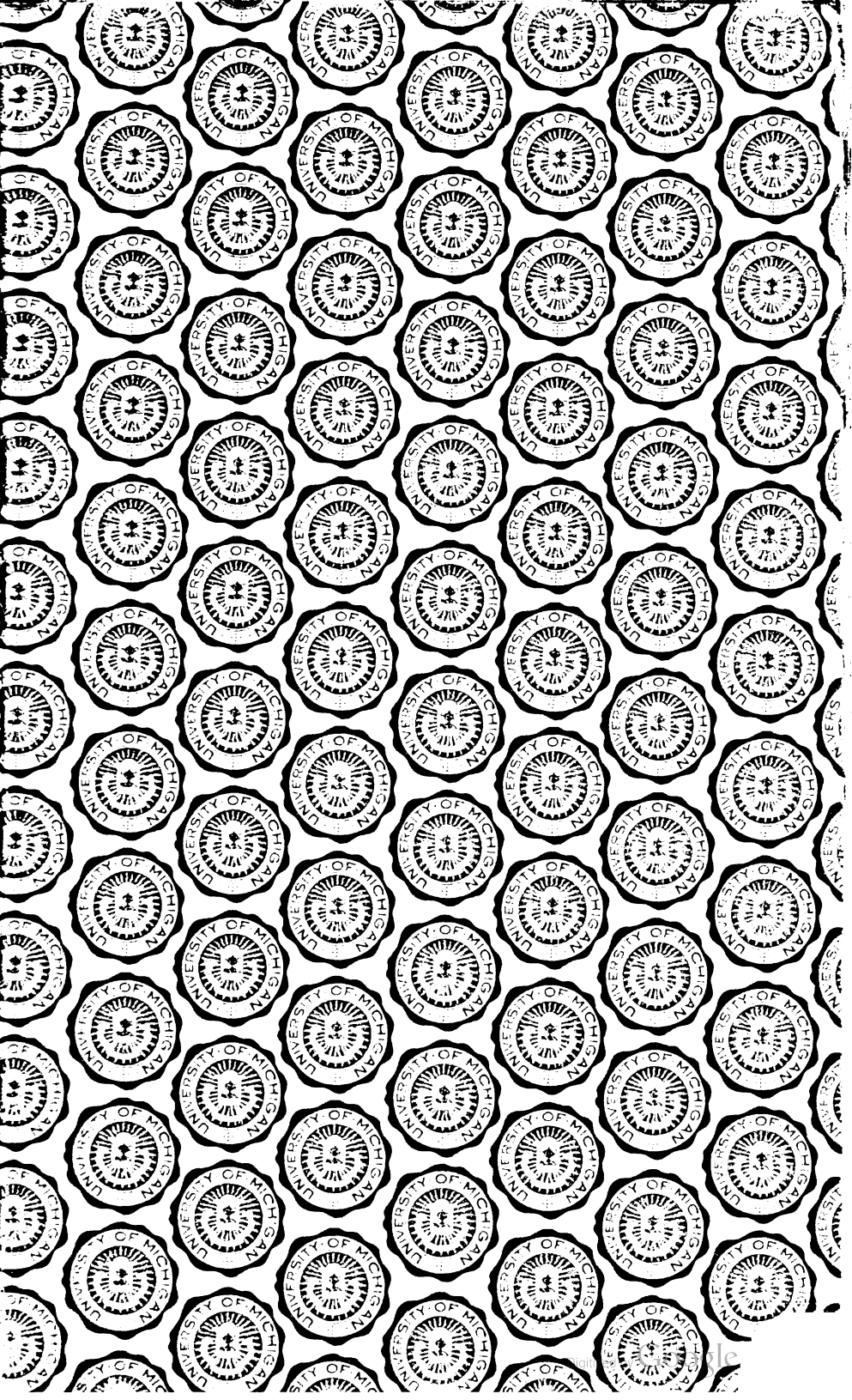
+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

1837
ARTES
VERITAS
SCIENTIA
LIBRARY OF THE
UNIVERSITY OF MICHIGAN
TIEBOR
SI QUAERIS PENINSULAM AMOENAM
CIRCUMSPICE


Digitized by Google

Digitized by Google

QK
358
.W66

Digitized by Google

Digitized by Google

Hdo Dammer
Friedman XII 1886

PRODROMUS FLORÆ PENINSULÆ INDIÆ ORIENTALIS.

Digitized by Google

In a few days will be Published,

CONTRIBUTIONS TO THE BOTANY OF INDIA.

By ROBERT WIGHT, M.D.

No. I. COMPOSITÆ WIGHTIANÆ. By Prof. Aug. Pyr. De Candolle.

II. ASCLEPIADEÆ INDICÆ.

Dr Wight having had prepared in India numerous Coloured Drawings illustrative of the Plants described in the Prodromus, similar to what have been already engraved for Dr Hooker's Botanical Miscellany, is willing to publish a selection of one or two hundred, as may be agreed on, as soon as a sufficient number of subscribers to cover the expenses have lodged their names with Messrs Parbury, Allen and Co. London. It is desirable that the plates be of a quarto size. The price is not supposed to exceed L.5 for each hundred, if there be 150 subscribers.

Digitized by Google

PRODROMUS FLORÆ PENINSULÆ INDIÆ ORIENTALIS:

CONTAINING

ABRIDGED DESCRIPTIONS OF THE PLANTS FOUND IN THE PENINSULA OF BRITISH INDIA,

ARRANGED ACCORDING TO THE

NATURAL SYSTEM.

BY

ROBERT WIGHT, M. D., F. L. S., &c.

MEMBER OF THE IMP. ACAD. NATURÆ CURIOSORUM,

SURGEON ON THE HON. EAST INDIA COMPANY'S MADRAS ESTABLISHMENT;

AND

G. A. WALKER-ARNOTT, A. M., F. L. S. & R. S. Ed.

VOL. I.

LONDON:

PARBURY, ALLEN, & CO.

MDCCCXXXIV.

Digitized by Google

EDINBURGH,
PRINTED BY NEILL & CO., OLD FISHMARKET.

Digitized by Google

TO THE

HONOURABLE THE COURT OF DIRECTORS

OF THE

EAST INDIA COMPANY,

THE ENLIGHTENED AND LIBERAL PATRONS

OF

BOTANICAL SCIENCE

THROUGHOUT THEIR EXTENSIVE ASIATIC TERRITORIES,

THIS WORK,

CONTAINING AN ABRIDGED DESCRIPTION OF ALL THE PLANTS

DISCOVERED IN ONE OF THE MOST VALUABLE

PORTIONS OF THEIR DOMINIONS,

IS, BY PERMISSION, RESPECTFULLY DEDICATED,

BY THEIR OBEDIENT AND VERY HUMBLE SERVANTS,

ROBT. WIGHT.

G. A. WALKER-ARNOTT.

Digitized by Google

Digitized by Google

Bot. Gard.
Jussieu
9.2.29
17569

PREFACE.

In the year 1768, John Gerard Koenig, a native of Denmark, a pupil of Linnæus, and an enthusiastic cultivator of natural science, landed in India, as physician to the Tranquebar missions. His example and instructions diffused a similar taste among his companions, and hence originated the botanical labours of the society of "United Brothers." These men, so well known and highly esteemed in Europe for their disinterested exertions towards the advancement of Botany, studied the science as a recreation from the more important, as well as more laborious, duties of instructing the natives of India in the wisdom of the west, and of thus fitting them to become partakers of the promises of the Gospel.

But although it may be said that scientific botany took its rise in India from Koenig, the flora of the country had not been entirely neglected by European botanists prior to that period, as the works of Rheede, Rumphius, Plukenet, the two Burmanns, and finally a large and well preserved, yet unfortunately almost unknown, collection of Indian plants in the Oxford herbarium, formed in the early part of the eighteenth century, amply testify.

The Hortus Malabaricus was undertaken at the suggestion of Henry van Rheede, a Dutch Governor of Malabar; the specimens were collected in 1674 and 1675 by the Bramins, and sent to Cochin, where drawings of them were executed by Mathæus, a Carmelite and missionary: corresponding descriptions were at the same time made in the Malabar language, which were afterwards translated into Portuguese by Emanuel Carneiro, a Cochin interpreter, and from that into Latin by Hermann van Douep, the secretary to the city of Cochin: the whole was under the superintendence of Casearius, a missionary there. The work was at length published at Amsterdam between 1686 and 1703, in 12 volumes folio, with 794 plates, and was edited by Commelyn, who has occasionally added remarks on the plants. The figures in general represent the habit so accurately, that there is seldom any difficulty in identifying them with the species they are intended to represent; but,

Digitized by Google

unfortunately, so little has our knowledge of the plants of Malabar advanced since Rheede's time, that several of his figures are at present referred only approximately, and consequently with doubt. In the present volume, however, from our having obtained a considerable number of species from the mountains about Courtallum, the vegetation of which resembles in several points that of Malabar, we have been enabled to decide upon many of them hitherto involved in obscurity. We have to regret, however, that we have not been able to procure a copy of Dennstedt's Schluessel zum Hortus Indicus Malabaricus, published at Weimar in 1818: it professes to give the botanical names for nearly all Rheede's plants, but from the slight examination we had once an opportunity of giving it, it appears to be a mere compilation, and to abound in errors.

Leonard Plukenet's works were published in London between 1696 and 1705, in 4 volumes quarto, containing 454 plates, with 2740 figures of plants, many of them Indian. These figures are small, and often much reduced from the natural size, especially when the plants were large, but are generally very characteristic: we have almost invariably referred to them, because they are much less costly and more easily procured than those of Rheede.

The materials of the Herbarium Amboinense of George Everhard Rumphius, a native of Hanover, a physician and a merchant, and afterwards consul of Amboina, were principally collected by himself, and drawings and Latin descriptions made at the time. Having afterwards become blind, he obtained the assistance of some young men in completing the work, and translating the descriptions into Dutch: it was finished in 1690. Rumphius died in Amboina in 1706, from which time the manuscript remained upwards of thirty years in the possession of the Dutch East India Company, but was at length rescued from oblivion by Professor John Burmann of Amsterdam, who not only edited it between the years 1741 and 1751, but has illustrated it with several remarks and synonyms, besides giving a translation into Latin, for Rumphius' original one appears to have been lost. This work consists of 6 volumes, with a supplemental one or seventh not published till 1757, and contains 696 plates, representing more than twice that number of plants. The plates are much less valuable than those of Rheede, but the descriptions on the contrary are much superior. Most of the plants are to this day very little known.

We may here state, that a most elaborate commentary on the Herbarium Amboinense was commenced by the late Dr Francis Buchanan Hamilton, in the Transactions of the Wernerian Society of Edinburgh; what is printed only extends to the middle of the 2d volume, but we understand that the remainder of the manuscript was presented to the

Digitized by Google

society before his death, and we trust that the publication will be ere long continued. He had at the same time prepared a commentary on the Hortus Malabaricus, which we believe is in the possession of the Linnean Society of London: that on the three first volumes is all which has yet appeared in their Transactions. From both these commentaries much useful information may be derived, particularly from the latter, from Dr Hamilton having himself explored a considerable portion of Malabar, as well as the contiguous province of Mysore; in many instances, however, we fear that his conclusions have been obtained from incorrect data, and in such cases we ourselves do not hesitate to dissent from them.

The Thesaurus Zeylanicus of John or the elder Burmann, was published in 1737, with 110 plates, containing figures of 155 plants, which are generally very characteristic and well executed. Although the island of Ceylon does not fall within the geographical limits of our work, the plants of both countries are often so much the same, that these plates must be considered as a great auxiliary, not only in determining the southern species of the Peninsula, but also in elucidating those of the Hortus Malabaricus.

Burmann's work appears to have been principally drawn up from specimens collected by Dr Paul Hermann, who was sent out in 1670 (he remained till 1677) to Ceylon, at the expense of the Dutch East India Company, for the purpose of describing all the plants and spices growing in that island. Hermann's Museum Zeylanicum was first published in 1717, although it appears to have been written many years before; besides the plants of Ceylon, it contains many species collected at the Cape of Good Hope, unfortunately not distinguished from the others, a circumstance which afterwards led Linnæus into the error of considering them all natives of the East.

"Hermann's herbarium had been lost upwards of half a century, until chance threw it into the hands of M. Gunther (apothecary to the King of Denmark), who sent it to Linnæus, requesting him to examine it, and affix the names to the plants throughout the collection. Its great value, from the collector having been so eminent a man, induced Linnæus to examine the whole with much attention, and he was thereby enabled to form many new genera, and settle many doubtful species. He published the result of his labours under the title of Flora Zeylanica, sistens plantas Indicas Zeylonæ insulæ, quæ olim 1670–1677, lectæ fuere a Paulo Hermanno, Professore Botanico Leydensi; demum post 70 annos ab A. Gunthero, Pharmacopæo Hafniensi, orbi redditæ. (Holm. 1747, 8vo. pp. 254. tab. 4.) In an appendix, the new genera are concisely given by themselves, copied from an academical dissertation published under Linnæus' presidency, by C. M. Dassow. This appendix occupies 14 pages out of the 254, and there are *indices* to the whole of the botanical,

Digitized by Google

Malabar, Cinghalese, and officinal names. This work is yet of use as a *pinax* of these plants, and as a Linnean catalogue of Burmann's Thesaurus Zeylanicus. The herbarium consisted of 600 plants, of which the true places in the system are assigned to more than 400; the remainder were too imperfect to admit of their being sufficiently determined. This volume is rendered valuable by a concise view of the progress of botany from the restoration of learning in the 16th century; a natural history of Ceylon, and its general produce; the life of Dr Hermann; a short account of Hartog, who was sent by Dr Sherard to make collections in that island; and a sketch of Burmann's Thesaurus Zeylanicus. Linnæus authenticates the herbarium by showing that the numbers and the plants answer to Hermann's Museum Zeylanicum. On the death of Count Moleke, who became the possessor of this herbarium after Gunther, it was purchased by Sir Joseph Banks (for seventy-five guineas), and still forms part of his immense collection. The specimens are miserably damaged and mutilated, but many of them retain the Cinghalese names annexed in Hermann's handwriting, and also generic names and synonyms in Linnæus's. They occupy four large bound volumes, three of which contain only Ceylon plants, and the fourth African and Indian plants together; in all of them the specimens are placed without regard to method, and apparently just in the order in which they were collected. There is a fifth volume, containing only drawings, which are not ill executed (for that period), and which amount to about 400 in number; but the same figure is in several instances given more than once *." This herbarium, along with Sir Joseph Banks's other collections, is now in the British Museum: we regret that our distance from the metropolis has prevented our consulting it, except for the elucidation of the Leguminosæ and Balsamineæ. It is well worthy the examination of any botanist conversant with the plants of the Peninsula or Ceylon, as it identifies many of Linnæus' species, of which he had no specimens in his own herbarium, and which are involved in much obscurity, from his having adduced at the same time synonyms from Rheede, Rumphius, or Plukenet, of plants much at variance with each other, and with what he himself had in view.

In 1768, Professor Nicholas Laur. Burmann of Amsterdam, son of the author of the Flora Zeylanica, published his Flora Indica, with 67 plates, containing figures of 178 plants, tolerably executed, but much inferior to those in the Flora Zeylanica. In this work, arranged according to the Linnean system, are described about 1500 species, but the names adopted and the synonyms are frequently so erroneous, that it is scarcely entitled to rank among the scientific works of modern times:

* Pulteney's General View of the Writings of Linnæus by Maton, p. 88.

Digitized by Google

it is therefore more consulted for its plates than for its descriptive characters. His herbarium is now the property of Baron Benjamin De Lessert of Paris, so deservedly styled by Agardh the "Josephus Banksius Gallorum." Professor De Candolle, by consulting it, has been enabled to point out, in his Prodromus, some very curious mistakes into which Burmann had fallen.

With regard to the Oxford Collection of Indian plants, we have only to express our sincere regret that we could not consult it thoroughly: to do so with any kind of satisfaction, it would have been necessary, either that we transported our own herbarium to Oxford, after our manuscript had been completed, or that the custodiers permitted it, or the duplicates only, to be sent to us to be examined while engaged in describing our own specimens: the former was quite impracticable; the latter perhaps as much so. It is, however, to be hoped that some means may soon be taken to bring it to the light; a very slight inspection satisfied us that it contains many, as yet, undescribed plants.

It is unnecessary to notice here the labours of Thunberg in Java, or the Flora Cochinchensis of Loureiro, as these eastern parts of India produce few plants in common with the district to which we are to confine ourselves.

We have already observed that scientific botany in India commenced with the arrival of Koenig, a Danish physician: previous to this, plants had been collected and transmitted to Europe, of which descriptions had been inserted by Linnæus and others in their various publications; but until Koenig made his appearance, no one in India had studied the vegetation according to the Linnean rules. His example was soon followed by many eminent individuals: among whom may be mentioned Jones, Fleming, Hunter, Anderson, Berry, John, Roxburgh, Heyne, Klein, Buchanan Hamilton, and the venerable Rottler, the only survivor of the illustrious group. Most of these formed themselves into a society for the purpose of promoting Botany: plants were industriously collected thoughout all the Peninsula, as well as in Ceylon, and were not unfrequently examined and named by the society in common; to such was usually added the word "*nobis.*" By degrees, however, their opportunities of meeting grew less frequent, and their confidence in themselves greater, so that Roxburgh, Klein and Rottler commenced attaching names without consulting with their friends: an interchange of specimens, however, still continued, so that it was rarely difficult for the one to know what was intended by the other. The value of such specimens was quickly felt, nor were they slow in transmitting them to Europe. Many of these plants were published in different works, sometimes under the name given by the donors: in other instances the name was changed, sometimes on the supposition that what was considered by the Indian botanists as

Digitized by Google

a mere variety, was in reality a distinct species; sometimes on the still cruder idea, that a plant named by one of the Missionaries must be different from another of the same name sent by some other of the society. Frequently the change has been made without even quoting the original name as a synonym, a practice which has created much confusion, and given rise to great difficulty in unravelling the synonyms.

Koenig's collections and manuscripts were most valuable, and are, we believe, still preserved among the Banksian collections in the British herbarium. Many of his discoveries were published in the Supplementum Plantarum of the younger Linnæus, in Retz's observations, and by Schrader; others were recorded by Vahl, who appears often, either not to have received names along with the specimens, or to have improperly substituted others for them. It is to be regretted that no attempt has been made to give to the world his descriptions as he left them; even at the present day they would tend to throw much light on eastern botany.

Dr John was the founder of the Missionary Garden at Tranquebar, into which were introduced many plants, chiefly of the Peninsula, but also from Ceylon. Specimens collected in this garden appear to have been diligently prepared, and a considerable number of them are in our collection, obtained from Klein's or the Madras herbarium. These we have usually described, but always marked them as doubtful natives, when we had no evidence of the same species occurring also in a wild state.

The plants distributed by Rottler were in part characterised very imperfectly, by himself, in the fourth volume of the Nova Acta Acad. Nat. Curiosorum of Berlin (Neuen Schriften der Berl. Gesellsch. Naturf. Freunde) published in 1803. Others were described by Willdenow, Vahl, and Smith; and frequently a new name has been bestowed without any regard to that given by Rottler: this may have partly arisen from observing that the specimens did not agree well either as to genus or species with the short phrases published by him; but European botanists ought to have recollected that Rottler's opportunities of instruction were not equal to theirs, and that even in their own works it seldom happens that two descriptions of the same plant are so alike as not to lead sometimes to suspicions that distinct species might have been in view. Another cause of the change of names, and also of the different characters given of the same plant, appears to have been the desire of naming, determining, and describing species from solitary and imperfect specimens, without making any allowance for the immense variation in foliage, pubescence, and even general aspect, to which all Indian plants are subject.

The specimens transmitted by Klein have been principally described by

Digitized by Google

Willdenow. Those of Heyne by Roth, in his Novæ Plantarum Species: Heyne appears to have been rather a diligent collector than a practical botanist; his collections were either obtained from, and were named by, Roxburgh; or were made in Mysore and the southern provinces, and the names attached by Rottler.

We ought not to pass over here the labours of Sonnerat and the other French naturalists settled at Pondicherry: immense collections seem to have been made and transmitted to France. These have not been described in any regular form, but such specimens as were presented to Lamarck, have been introduced into his Encyclopedie Methodique, a work from which, although its alphabetical arrangement renders it very difficult of consultation, particularly in those genera which have been much subdivided of late years, we have reaped great information.

Dr William Roxburgh was the first to describe fully, accurately, and reduce to the form of a Flora, according to the Linnean system, the riches of the East. During the earlier part of his career he resided in the Peninsula, particularly about Samulcottah, where he had ample opportunities of examining the botany of the neighbouring Circar mountains. In the autumn of 1793, from his great merit, he was removed to Calcutta, to undertake the superintendence of the Company's Botanic Garden there: here he remained till 1814, adding new descriptions to his manuscript, when "the illness which unhappily terminated in depriving the world of his labours, compelled him to undertake a voyage for the sake of his health, which he at first intended should have been only to the Cape. His declining state of health, however, induced him to proceed as far as St Helena. During his stay in that island, he, ever attentive to the interests of science, improved the opportunity by describing most of the plants he found growing there. After his arrival in England, whither he was at length obliged to proceed, he entertained considerable hopes of being able to put the Flora Indica to the press; and once wrote to the editor (Dr Carey of Serampore) that, in preparing it for this purpose, he hoped to procure the assistance of one of the first botanists of the present day, Mr Robert Brown. Death, however, soon prevented his accomplishing this object, which he had so much at heart."*

Previous to leaving India, several manuscript copies of the Flora Indica had been made; besides others, one was sent to England to the East India Company, and another was left in the possession of Dr Carey: from these having been written by natives who did not understand the language, not a few various readings have crept in, so that in several instances it is difficult to penetrate the real meaning of the author:

* Carey's preface to his and Wallich's edition of the Flora Indica.

Digitized by Google

we mention this the more readily, because we have occasionally observed that foreign botanists, in translating passages from the Flora into Latin, have, from not attending to the above circumstance, and from not correcting before translating, given a total perversion of the sense originally intended.

Dr Carey and Dr Wallich edited and published the first volume (including all from Monandria to the end of Tetrandria) in 1820; and the second (containing nearly all Pentandria-Monogynia) in 1824; both are enriched with many new species described by Wallich: no more of that edition has appeared. At length Captains James and Bruce Roxburgh, sons of Dr Roxburgh, perceiving that new botanists were daily starting up in India, whose labours might abridge the hard-earned and well deserved, although still hidden, laurels of their father, determined on giving to the world the Flora Indica as left by Dr Roxburgh. This work is in three volumes, and made its appearance in 1832: the first volume contains from Monandria to nearly the end of Pentandria-Monogynia, and corresponds precisely to the two volumes of the former edition, but omits the new species added by Dr Wallich: the second includes the remainder of Pentandria, and Polyandria-Polygynia, with the other intermediate classes and orders: the third commences with Didynamia, and concludes with Dicœcia. In the advertisement to the first volume it is stated that the work was to be completed in four volumes, while, from the preface to the third, we fear that it is already finished: the Ferns, and the few species referred by Roxburgh in the Hortus Bengalensis, or Catalogue of the Calcutta Garden, to Polygamia, are, however, still wanting. From this edition we have derived the greatest benefit: the third volume only reached us while correcting the proof of the sheet containing *Rhamneæ*, so that our elucidation of the *Malvaceæ* may not be so perfect as we could have desired. The impression appears to have been very limited, and few copies have found their way to Europe.

But not only did Dr Roxburgh describe the plants he observed, but he had at the same time splendidly coloured drawings made of most of them. These, upwards of 2000 in number, he presented to the East India Company: from them a selection of 300 was allowed to be made, and ordered to be published by the Court of Directors, under the superintendence of Sir Joseph Banks: this magnificent work, entitled The Plants of Coromandel, was commenced in 1795 and completed in 1816, in three enormous volumes. In the first, at t. 32, the plant named *Roxburghia* is introduced, which has given rise to the following injudicious remark by De Theis in his Glossaire du Botanique, p. 407. "W. Roxburgh, Ecossois, a publié, en 1795, un ouvrage sur les plantes de la côte de Coromandel, dans lequel lui-même a établi ce genre. C'est un usage generalement établi, que les botanistes se dedient reciproquement

Digitized by Google

des plantes; Roxburgh est le premier qui l'ait fait pour lui-même:" but this criticism is incorrect, for the name was given not by Roxburgh but by Dryander, under Sir Joseph Banks's direction; Roxburgh, we understand, supposed it to be the same with *Stemona tuberosa* of Loureiro, to which indeed it appears to be very closely allied.

Copies of all the unpublished drawings were made on a reduced scale by Dr Hooker. These, with that liberality for which our friend is so distinguished, have been placed in our hands, a circumstance which must stamp a value upon our work which it could not otherwise have enjoyed: they are accompanied by the temporary manuscript names attached by Roxburgh, and not unfrequently also with the native name, and extracts from his then unpublished descriptions. Although, therefore, Roxburgh afterwards has frequently given names in the Flora Indica different from those under which he had distributed specimens, or had sent the drawings and descriptions to the India House, it has been in our power in almost every plant to clear up his synonyms with satisfaction. We trust our excellent friend will accept our thanks, thus publicly tendered, for this most essential service.

In 1800 and 1801, Dr Buchanan Hamilton made a "Journey from Madras through the countries of Mysore, Canara, and Malabar," under the orders of the Marquis of Wellesley, "for the express purpose of investigating the state of agriculture, arts, and commerce, the religion, manners and customs, the history, natural and civil, and antiquities, in the dominions of the Rajah of Mysore:" an account of his observations was afterwards published in three volumes 4to; this work we have not had an opportunity of consulting. He has also introduced into his Commentary upon Rheede's Hortus Malabaricus, published in the Linnean Society's Transactions, vols. xiii, xiv, and xv, descriptions of several new Peninsular species: of these we have availed ourselves.

Leschenault de la Tour, a French botanist, who accompanied Baudin's voyage to the Moluccas, Java, and Sumatra, appears to have been appointed director of the Botanic Garden at Pondicherry, and to have investigated some of the southern provinces of the Peninsula: the plants he collected seem, however, to be chiefly from the Neelgherries, and are principally published by De Candolle in his Prodromus Systematis Naturalis Vegetabilium.

In 1828, Dr Wallich, who succeeded Dr Roxburgh as superintendent of the Botanic Garden at Calcutta, arrived in England with an enormous number of specimens of plants, which he had been accumulating for several years. Here were collections made by himself and those along with him in the Calcutta garden, in Nepaul, in Singapore and Penang, in the Kingdom of Oude, Rohilcund, the Valley of Deyra, Martaban, Ava, &c.: collections in Silhet by Francis de Silva, in Kamaon by Robert Blink-

Digitized by Google

worth, in Srinaghur by Kamroop, in Tavoy and the Tenasserim coast by William Gomez, plant collectors under Dr Wallich: in addition were specimens collected by Heyne in the Peninsula generally, by Noton in the Neelgherries, by Moorcroft in the more elevated mountains bounding India on the north, in the Himalayan range by Dr Royle, in Sirmore by Mr S. Webb and Dr Govan, in Silhet and Chittagong by Bruce, in Pundua by Smith, and in Penang by Porter. Upon application to the Company, Dr Wallich was permitted to put his generous wishes into execution, and to distribute the whole of these treasures among the principal botanists of the present day, who were also invited to publish respectively different portions of them. Not only did he direct this herculean labour, but examined himself most of the materials, with the view of forming a complete catalogue with numbers corresponding to the specimens distributed: this catalogue or "List of dried specimens of plants in the East India Company's Museum," consists of 253 pages folio, exclusive of the *indices;* it is executed in lithography, and was written by Dr Wallich himself. The distribution was originally intended to be confined to what Dr Wallich brought to England along with him; but other collections, and very extensive ones, were still lying at the India House: these also, at his request, were put at his disposal. The following notice accordingly appeared at p. 60 of the Catalogue.

"Since the preceding sheets were printed, the under-mentioned herbaria have been added, from the East India Company's museum, to the collection brought home by Dr Wallich, principally with a view to the distribution of their duplicates. They will be indicated in the manner noticed below.

"1. An herbarium, collected chiefly in the Circars, by the late Dr Patrick Russell, contains no duplicates.—*Herb. Russell.*

"2. An extensive herbarium, from the Peninsula of India, collected apparently by the late Drs Klein and Heyne, and by Dr Rottler: it contains many duplicates.—*Herb. Madras.*

"3. A very extensive herbarium, collected in various parts of Hindostan, by the late Dr Francis Hamilton (formerly Buchanan): containing not many duplicates.—*Herb. Ham.*

"4. A small herbarium of the late Dr Roxburgh: no duplicates.—*Herb. Roxb.*

"5. An herbarium, collected by the late Mr George Finlayson, surgeon and naturalist to the mission which was sent to Siam and Cochin-China by the Bengal Government in 1821: contains some duplicates.—*Herb. Finl.*

"6. A most extensive herbarium, collected in various parts of the Peninsula of India, by Mr Assistant-Surgeon Robert Wight, lately in

Digitized by Google

charge of the botanical establishment at Madras: contains a great number of duplicates.—*Herb. Wight.*

"7. Several collections, forwarded by Dr Wallich to the Company's museum, and including a vast number of duplicates. They will be referred to in the manner heretofore adopted."

Notwithstanding the great personal exertion made by Dr Wallich, and assistance he had procured from others, his leave of absence, although prolonged by the Company, proved too short for the accomplishment of his gigantic undertaking: the List concludes with No. 7683, and yet it contains few Rubiaceæ, scarcely any Grasses, no Euphorbiaceæ or Sapindaceæ, and almost no Asclepiadeæ or Terebinthaceæ. The Asclepiadeæ have been since arranged and named by one of the authors of the present work, but the other orders mentioned are deposited and remain almost untouched with the Linnean Society of London: it is, however, to be hoped that Mr Brown, who, we understand, undertook the elaboration of the Gramineæ and Rubiaceæ, will ere long accomplish their examination; and our friend Dr Roeper of Bale, who was requested by Dr Wallich to describe the Euphorbiaceæ, is, he informs us, quite ready to commence so soon as a collection is laid aside and sent him for that purpose.

It is difficult throughout whether more to admire the indefatigable and disinterested assiduity of Dr Wallich, or the liberal decisions of the East India Company: the latter, not contented with what had been already done by them, after the distribution was accomplished so far as Dr Wallich's time would permit, concluded by presenting to the Linnean Society the entire magnificent collection laid aside for their own museum: but we cannot refrain from inserting in this place the letter on the occasion from the Honourable the Court of Directors to the Viscount Stanley, President of the Society.

"My Lord, East India House, 19*th June* 1832.

"The Court of Directors of the East India Company have, within the last four years, caused to be distributed to various bodies in this country and in Europe, interested in the promotion of science, between 7000 and 8000 species of plants collected by celebrated naturalists in the Company's service, during a series of years, in India.

"The objects being attained for which the originals of these specimens have been placed with Dr Wallich in Frith Street, the Court of Directors feel that this collection may not be an unacceptable addition to the Museum of the Linnean Society of London, which already possesses the herbarium of the celebrated Linnæus. We have therefore the honour, at the instance of the Court of Directors, and in the name of the East India Company, to proffer, through your Lordship, for the acceptance of the Linnean Society, the collection in question; and should the Council of the Society be pleased to give effect to the intentions of the Court, the necessary directions will be gi-

Digitized by Google

ven to Dr Wallich to transfer the collection to the party who may be authorised by the Council to receive the same. We have the honour to be, my Lord, your Lordship's most obedient humble servant,

(Signed) "JOHN G. RAVENSHAW.
"C. MARJORIBANKS."

It is scarcely necessary to add, that "the Council, in name of the Society, accepted with feelings of profound gratitude the collection thus proffered to them, and begged to assure the Court that it shall be held as a trust for the general benefit of science." Cabinets were immediately ordered for the purpose of containing it, and already great progress has been made towards its arrangement.

Dr Wallich, before leaving India, had commenced a Tentamen Floræ Nepalensis Illustratæ, intended to present a detailed description and a lithographic figure of the principal plants of that country. Two numbers only have appeared, each of twenty-five plates, which, in addition to their botanical interest, deserve to be noticed as being the first attempt at lithographic botanical plates in India, and executed by native artists. But while in England, he planned and executed, amidst his other engagements above alluded to, a work of a much more splendid nature. This, the Plantæ Asiaticæ Rariores, consists of three volumes folio, and contains 295 coloured lithographic plates, with a map of India, on which are delineated the different routes of the principal botanists: in the accompanying letter-press will be found some admirable monographs, as those by Professor Nees Von Esenbeck on Indian Laurineæ and Acanthaceæ, that by Mr Bentham on the Labiatæ, Professor Meisner on the genus Polygonum, and Von Martius on Restiaceæ. "This is," to use the language of Professor Hooker, than whom no one is more capable of judging, "his *magnum opus*, and that on which Dr Wallich's fame as a botanist may safely rest; a work which, whether for the beauty or rarity and interest of the subjects, the execution of the plates, or the accuracy of the descriptions, is surpassed by no publication of this or any other period. It is not possible to conceive how Dr Wallich can have accomplished so laborious a task, amidst all his other important employments, but by the consideration that many of these materials were completed while the author was yet resident in India."

We now proceed to mention the materials from which our own work has been principally drawn up. By glancing the eye over the supplemental collections enumerated by Dr Wallich, and noticed above, it may be observed that the sixth was made by Dr Wight, one of the authors of the present volume. The specimens were obtained from various parts of the Peninsula, as Samulcottah and the Rajahmundry Circars, Madras, Neelgherries, Dindygul mountains, and Courtallum. A corresponding

Digitized by Google

specimen and name (although unfortunately often without the précise locality) was for the most part retained, when there were duplicates, so that in most instances we have been enabled to identify our plant with that mentioned in Dr Wallich's List. At that time Dr Wight had the charge of the botanical establishment at Madras, and was on the eve of departure on a very extensive tour, calculated to occupy him nearly two years, in which he intended to visit all the richest botanic districts in the south of India, including the Malabar coast. But this, the only establishment in the Madras Presidency, was dissolved; the expedition was thus stopped, and Dr Wight removed to Negapatam, in the neighbourbood of which the principal collections were made, which he has had in his power to distribute since his arrival in England. His collectors, however, in other parts have proved diligent, so that plants from considerable distances, as Courtallum and Dindygul, have also accumulated on our hands. Besides, a valuable collection of Klein's and Rottler's plants was procured by purchase a short time before he left India; and these specimens being named, have afforded us much assistance in clearing up many doubtful synonyms in Willdenow, Roth, De Candolle, and other authors.

Almost all our new species are from the mountainous districts; but, notwithstanding, we are satisfied that our knowledge of them is yet very limited; so limited, that when the Neelgherries and Dindygul mountains are properly explored, it is probable that a third or even more will be added to the catalogue of Peninsular plants.

We are quite confident, on the other hand, that few or almost no novelties occur along the eastern coast; the hawk eyes of the missionaries appear to have passed nothing there: yet every day we see plants described as new species from these well explored parts. To remedy this evil has been the most invidious and perhaps most difficult part of our task; so different were often the descriptions given, and the genera in which the plants were put, that it often required a stretch of imagination, and the seizing of some single remarkable point of structure, to bring them together for comparison. When we had full descriptions before us, as in Lamarck's Encyclopedie Methodique, we have felt more at home: in such cases we have not unfrequently found it advantageous to picture the plant in the mind's eye from the description, and have been sometimes fortunate, in consequence, in discovering its true affinity; but having done this, before we could get it to quadrate exactly with any of our own, we have been sometimes obliged to discard part of the description as erroneous, or taken from some other species. Our motives for this have principally arisen from the firm conviction that almost all the plants described by Willdenow, Lamarck, Vahl, Roth, and others, from the Peninsula (or East India as it was usually termed by these bo-

Digitized by Google

tanists), occur in some form or other either in the collections before us or in those made by the missionaries; and we have been confirmed in this view by numerous instances, in which we had authentic materials to guide us; sometimes we have found the descriptions so much at variance with facts, that it was only by trusting to the correctness of the missionaries, and we have almost invariably found their information trustworthy when weighed with collateral evidence, that we could believe that the describer had the same species before him; in other instances the descriptions have been obviously strained and exaggerated, to exhibit a difference in words which does not exist in nature.

In the present volume, for which we are solely responsible, the descriptions having been drawn up by ourselves without any assistance by our friends, we have been careful, as far as possible, to exhaust the resources above alluded to, before we attempted to frame a new species: from the imperfection of the characters of the essential or invariable parts given by most botanists, we have in some instances found it beyond our power to execute our wishes, and have marked such species with doubt. But grateful shall we feel to any one who may clear them up, and point out what they really are: he will act a much kinder part towards the future botanist, and will contribute much more to the advancement of the science, who removes a host of the useless names that encumber its pages, than he who, through a vain desire of seeing his name attached to that of a plant, shall contribute to the already too great confusion, by adding species which can neither be characterized in words nor are substantiated by nature. It is, however, easier to prevent mischief than to remove its evils.

Our second volume will be enriched by several valuable contributions, which we take the present opportunity of acknowledging, and for which we beg to return our sincere thanks to the authors. Professor De Candolle has already named for us the greater part of the *Compositæ*, and has communicated some valuable notes on the new species. Professor Nees von Esenbeck has elaborated in Wallich's Plantæ Asiaticæ Rariores our *Acanthaceæ* and *Laurineæ*, and is again revising for our use that part of his paper particularly referring to the Peninsula. He has likewise transmitted us a manuscript containing the description of the *Solaneæ* and *Gramineæ*, and is also at present engaged with our *Cyperaceæ*. The *Labiatæ* and *Scrophularineæ* are under the care of George Bentham, Esq. the able author of the monograph of the *Labiatæ*. Dr Lindley is to take up the *Orchideæ*, Dr Hooker the *Filices*, and Dr Greville the *Algæ*. Professor Von Martius has already described, in Dr Wallich's Pl. As. Rar., all our *Restiaceæ*, and Dr C. M. Meisner of Berne our species of *Polygonum* in the same work. It was Dr Graham's intention, as he had been entrusted with all Dr Wallich's, to contribute a

Digitized by Google

considerable portion towards our first volume by the elucidation of our *Leguminosæ*, but when further delay was impossible, he, unfortunately for us and for the botanical world, found himself prevented by other numerous and more pressing avocations.

Our descriptions of the genera will usually be found detailed, while those of the species almost always much exceed the Linnean rule of twelve words. Species, however, have so multiplied since the days of the Father of Botany, that it may be readily conceived that specific characters, having to distinguish between more species than before, must sustain a corresponding elongation; but we readily allow that this is not the principle by which we have been actuated. In a country of such an extent as India, much novelty must still be looked for; and our aim has therefore been, in framing characters for the species, to exhaust every essential point not common to the whole genus, and to exhibit the various variations of foliage and pubescence which have fallen under our own observation: our characters may therefore be more properly called abridged descriptions, every thing superfluous or of no importance being omitted. We trust, therefore, that when new plants are discovered, their differences will be readily observed; and, on the other hand, we hope that if a plant, although coming from a very different part of the country, falls under our description, it will not be deemed necessary to bestow on it a new appellation.

We shall perhaps be severely censured for cutting down species. We have all along considered it as trifling with nature to separate species on slight or variable grounds, nor could we ever understand the "*cui bono*" for which so much ingenuity in splitting hairs has been wasted. Before we determined what was a species, we examined with care numerous specimens from the same and different localities; and so far we have had an advantage over many other of the European botanists who have described Indian plants, they having only seen one or two isolated specimens. Numerous observations too were made on the plants in their natural situation, the result of which went to prove, what we have frequently endeavoured to enforce by examples throughout the present volume, that no precise shape of leaf or quantity of pubescence is of any value, although both of these seem in each species to be limited within certain variations. With regard to varieties, we have seldom distinguished any unless well marked and tolerably constant; we are aware, indeed, that these correspond to what some naturalists call species, but our own observations have convinced us, that varieties and forms, as well as species, may be constant in similar situations, and even in widely different situations, for many years, if raised from seeds either obtained from the original locality or from cultivated plants; the cultivated cerealia and garden vegetables ought to lead to such an hypothesis without any additional proof.

Digitized by Google

The terms employed by us in our characters or descriptions are usually either purely English, or as close as their Latin etymology will permit; in the latter case, we have often preferred spelling the concluding syllable as near as possible to the Latin word, to adopting the more legitimate rules prescribed for such cases by English grammarians, (thus the Latin *-osus*, we have generally rendered by *-ose* instead of *-ous*), because frequently by the latter we should have had to adopt the words already employed in English under various senses, none of which are strictly in conformity with our meaning. But all these terms are explained in the more common elementary works: one or two only occur, which we have used restrictively, and these we shall here mention, because they appear to be applied by several distinguished botanists either indiscriminately or differently from what we have done.

Even, not torulose or undulated, and with a plane surface.
Smooth, without asperities.
Glabrous, without hairs or pubescence.
Drooping, by this we mean in Latin *pendulus*, but we sometimes may have also employed the word *pendulous*.
Free, not cohering with any thing; as the ovary and fruit in *Salicarieæ*.
Distinct, free from each other; as the carpels in *Ranunculus*.
Evident, manifest or conspicuous.

In addition to these restricted words, we may mention one which we have employed in the original but very wide sense, we mean *pinnated*: De Candolle applies it only when the leaflets are jointed with the petiole, as in the orange and leguminous tribes; but we have found it sometimes a matter of considerable difficulty to determine, in the dried specimens, whether there be true joints or not: besides, the term *pinnatisect*, to imply a division of the leaf without joints, has hitherto been scarcely, if at all, introduced into any English botanical work. The words *pinnated* and *leaflet*, then, in this volume, have no reference to the existence or non-existence of joints between the leaflets and the petiole.

Our synonyms may be classed under two heads; works constantly referred to, and works only occasionally so. To the former belong De Candolle's Prodromus Systematis Natur. Vegetabilium (of which only four volumes, the last concluding with *Dipsaceæ*, are published); Sprengel's Systema Vegetabilium, being the last catalogue, although in many points exceedingly incorrect, according to the Linnean system; Roth's Novæ Plantarum Species; Roxburgh's Coromandel Plants, and his Flora Indica, both editions: of plates without scientific descriptions, Rheede's Hortus Malabaricus, Rumphius's Herbarium Amboinense, Burmann's Thesaurus Zeylanicus, and Plukenet's figures, are quoted: and of catalogues, Wallich's List already mentioned, and Wight's Catalogue, both lithographed for the purpose of accompanying the specimens distributed. The second class of authors we scarcely think it necessary

Digitized by Google

to enumerate here; Linnæus, Vahl, Willdenow, Lamarck, and many others, might be mentioned; these are only quoted when they have bestowed a new appellation, whether upon a new species or an old one. One very scarce work we regret we had no opportunity of consulting while engaged with the *Byttneriaceæ*, we mean Schott and Endlicher's Meletemata Botanica; but most of the new genera there proposed may be classed among what St Hilaire calls transitory ones. In all instances where we have seen and examined carefully an authentic specimen, either in the author's own herbarium, or had a corresponding one before us when we were describing the plant, we have affixed to the name of the author a point of admiration (!), the symbol adopted by De Candolle to denote what we have just explained.

It may perhaps be objected that we have not given native names; these we have intentionally omitted, partly for the reasons stated, and in accordance with the observations made by Dr Wallich at page 99 of the 2d volume of his edition of the Flora Indica. "I avail myself of this opportunity for remarking, that the names which are given to plants by the natives of Nepaul are in general very uncertain and fluctuating; and that I shall only make use of them on occasions when I have reason to be tolerably satisfied as to their correctness." The soundness of which is further proved by a remark of Dr Carey, at p. 415 of the same volume, in a note on the word *Munko-khoshee*. "The name here given as a Newar name, is, in the extract of Dr Buchanan's letter, written *Munko khoshee*, and is one out of hundreds which might easily be produced, of the mistakes which constantly occur when persons unacquainted, in some measure at least, with the languages, set down words from the mouth of natives. Dr Buchanan spoke only Hindoosthanee, and a Newar man gave him, as a reply to a question *Munko khoshee*, a Hindoosthanee word, which means *pleasure or delight to the mind*. This might be the Hindoosthanee word by which the tree is designated by the Nipalese, but it is much more probable the man only intended to say *it was a delightful tree*. The above mentioned circumstance, and likewise the great number of native names of plants, seemingly obtained with the utmost ease by other gentlemen who have merely run through a country as collectors, (which however was not the case with Dr Buchanan), added to the difficulty I have myself found in obtaining names, and the uncertainty of those commonly obtained, fully dispose me to coincide with the suggestion of my friend Wallich in his note at the foot of page 99." The supposed native names given to De Candolle and Jussieu by Leschenault, along with the specimens collected by him in the southern parts of the Peninsula, corroborate strongly the opinion of Dr Carey: they are in general a mere burlesque on names, meaning often that the natives *had no name for the plant*, or *did not*

Digitized by Google

know it: in other instances, it appears to have been not the name of the plant, but the name of the village near which it was found, which had been marked down. Dr Wight has frequently received six or eight names, totally distinct from each other, and formed from very different roots, for the same plant, within a few miles of each other: in short, the natives seem to have no rule either for nomenclature or orthography; they have no means of producing an uniformity of names, and very frequently confound one name with another, so that our inserting these would only tend to mislead, in place of proving an aid in the investigation of an unknown plant, by one unacquainted with botany. Owing to very different plants having the same native name, we have occasionally known dangerous mistakes originate, by erroneously substituting active medicines when those of an opposite kind were intended, and *vice versa*. On these last grounds particularly, we not only think it useless but injurious, nay even dangerous, to insert these names, unless the natives themselves shall have discovered some method by which a plant shall be known throughout by but one name, and that name shall be restricted to the individual plant. We cannot too strongly object to the practice of some French botanists of our own day, converting these most unmeaning and usually harsh sounding names into generic ones; a practice only to be tolerated in the case of plants well known, and already rendered somewhat classical, by the figures in Rheede and Rumphius.

As to the limits of our Flora, it will be found, on looking at a map, to be very extensive: our intention was to include all the tract of country that lies within the irregular-sided triangle formed by Cape Comorin, Surat, and Rajahmundry; or, in other words, from North lat. 8° to 21° on the west coast, and to about 17° on the east; and from East longitude 73° to 83°. But the Malabar coast has been almost totally neglected as to botany since the days of Rheede; and notwithstanding our utmost exertions, we have not succeeded in obtaining a single species from the Bombay Presidency. According to the map in Dr Wallich's splendid work so often referred to, Col. Sykes appears to have explored the neighbourhood of Bombay; but we have no information about his collections. It is to be hoped that some of the Company's officers resident there, when they know the great exertions that have been made in the other Presidencies, and see the noble patronage which the Company affords to science, will one day wipe away the stain. Our present information is limited to the east coast, the extreme southern part of the west, and the central southern provinces.

The uncertainty of the number of stamens in the genera, and often also in the same species, of tropical plants, puts so much at defiance the sexual system of Linnæus, that we have thought it advisable, in the present work, to follow the natural arrangement: this will further afford us

Digitized by Google

the means of better illustrating the subject, by the introduction of many collateral observations altogether incompatible with the Linnean classification. We adopt this arrangement the more readily, as, in addition to the advantages it possesses for the above purpose, we are inclined to believe that the facilities it affords for making out a genus hitherto unknown to us, are nearly as great as that of the artificial system, while it conveys at the same time much more solid information. We allow that it is usually much more difficult to determine the natural order to which a plant belongs, than to discover the Linnean class and order; but this difficulty is more than compensated, by the facility with which, when it is once overcome, the genus, even in large orders, is afterwards fixed upon: besides, there is here an inducement to collectors to gather the specimens in all states from flower to fruit; and, indeed, it would be often desirable that the specimens were destroyed, if incomplete, rather than that they should fall into the hands of botanists who may give a name, when a perfect description was impossible. In examining a plant by the Linnean system, we have scarcely advanced one step when we have discovered its class and order, but the difficulties to be surmounted are now greater than before: on the contrary, when we have ascertained the natural order to which our plant belongs, our difficulties are on the decrease, and we have already acquired much information regarding its structure, affinities, and properties. As numerous observations and experiments have shewn that nearly similar virtues are found in nearly all the plants of an order, we can thus, without advancing further than the mere determination of the order, often ascertain the qualities of imperfectly known or newly discovered plants. To a medical man, a knowledge of such a system, it must at once be acknowledged, is of the highest importance: the properties of one known plant guide him to discover another, a substitute for it, in a country where the original remedy cannot be procured; nor need he do this empirically, and with fear or hesitation, but he can proceed upon fixed principles, and with confidence.

The natural method having thus in view not the mere naming of plants, which can of itself be interesting to only a limited number of individuals, but the classifying them according to the groups which Nature herself forms, or rather as Nature forms only species, according to the resemblance that one tribe of vegetables bears to another, as to external form, internal structure, and properties, we must consequently conform as much as possible to her laws: and to know these we must first attain a precise idea of the organization of plants, studying minutely all their parts, and the functions of each. This knowledge, however, may be obtained from any good elementary treatise *.

* The most compact and cheapest, but requiring much study, is that by Dr Lindley, entitled *An Outline of the First Principles of Botany*. Lond. 1830.

Digitized by Google

But as this is the first work, arranged according to the natural system, intended for the use of Indian botanists, whose portable libraries can admit of but few publications on the subject, we shall take the liberty of concluding this rather lengthened preface by the following short introduction to the principles of the system and the classification we have adopted, written by Mr Arnott originally for the seventh edition of the Encyclopædia Britannica, and published in the fifth volume (p. 92) of that work.

When different seeds taken from the same plant are made to germinate, we have individuals not entirely agreeing in the shape of the leaves, or the height of the stem; from which we may infer that characters derived from these are of the least importance; and consequently, when we describe species, we must use such with great caution. But when we rise a step higher, and group species into genera, we find so great a variety in both the stem and leaves, that we are forced to look for characters elsewhere, and thus resort to the different parts of the flower; and all genera are therefore founded on a consideration of these. When, however, we come to examine a genus by itself, we shall find that perhaps none of these parts are sufficiently constant, some species differing from others in the number or shape of the sepals, or petals, or stamens, or pistilla, so that we are obliged to call into action not any particular one, but a combination of the whole. While doing this, it cannot escape our notice that the more external portions, as the calyx, exhibiting more of the foliaceous origin, are less constant than the petals; and these again less so than the stamens; but the stamens and pistils having least of the structure of the original leaf, are the most uniform: and hence Linnæus, influenced principally however by these being the true sexual organs, adopted the stamina and pistils as the basis of his system. Now in many natural genera, plants differ from one another only specifically, although there happen to be a difference in the number of parts of the reproductive organs; so that number, not being at all times sufficient to constitute a genus, can still less be relied on for a higher division. The structure must thus be considered, and this we not only find common to the species of a genus, and even often to different genera so allied in aspect, that at first we might consider them all as one great genus; and such great genus being in fact an order, we are led, while defining it, to place considerable dependence on the structure of the anthers, but more especially on the fruit, the ultimate metamorphosis of the primary leaf. But on comparing together two or more orders otherwise very closely allied, we often perceive very different structures of the fruit, so that, in search of something more fixed, we are compelled to dip still deeper into the economy of the plant and examine the seed. Here, indeed, we

Digitized by Google

find a great diversity in the external form; but on scrutinizing the interior, particularly the embryo, or the very rudiment of a new plant, we find only *two* modifications; and each of these, after having opened different seeds, we perceive to be constant to a very great class of plants united together, whether by the structure of the fruit, the number of stamens, or by the flower, or by the anatomy of the stems, or by the leaves. These modifications of the embryo, resting on there being one or two cotyledons, must thus form the groundwork of a natural method: it was already foreseen by Linnæus, but was demonstrated by Jussieu. We only here allude to those plants in which a seed and embryo exists; for the very principle from which we started implies their existence. A primary division, then, pointed out by nature, is therefore obviously into those with flowers, and those that have none, or into those which have seeds and an embryo, and such as have neither true seeds nor an embryo.

We have thus a division into *Exembryonate* and *Embryonate* vegetables. The former having no embryo, can have no cotyledons, and are often termed *Acotyledones;* their stems do not appear to present spiral vessels; hence they are also called *Cellulares*, and are distinguished into those which have tubular vessels or ducts, *Ductulosæ*, and those without ducts, *Eductulosæ*. De Candolle, however, and some other eminent botanists, arrange the *Ductulosæ* with the *Vasculares*.

The *Embryonate* vegetables, possessing true spiral vessels, and hence called *Vasculares*, divide into those with one, and those with two cotyledons, which was no sooner fixed than many corresponding differences of structure became perceptible. Thus *Monocotyledones* shew a radicle that projects the root through a covering. The divisions of the flower are ternary; the leaves are curvinerved, primarily alternate or spiral, but indicating a disposition to become opposite at the summit of the plant; the stem is cylindrical, and increases in diameter from within by an expansion of the vascular fibre. The *Dicotyledones*, on the contrary, have opposite cotyledones; the radicle of the embryo becomes a root by mere development; the division of the flower is usually quinary; the leaves are angulinerved, and primarily opposite or verticillate, with a tendency to become alternate towards the inflorescence; the stem is conical, with a bark, both increasing by concentric layers, the stem from without, the bark from within*.

Having thus attained primary divisions with important and constant

* To these, as to all general rules, exceptions occur. Thus sometimes, as in the Dicotyledones, the embryo is not distinguishable into cotyledons and radicle: but one of the most remarkable cases is to be found among parasitical plants, in several of which, although the number and structure of the parts of the flower obviously mark them as belonging either to the Monocotyledonous or Dicotyledonous vegetables, the seed appears to be almost or quite homogeneous, and the stems perfectly cellular (without ducts or spiral vessels), as in the Acotyledones.

Digitized by Google

characters, we are now to proceed to subdivide these into orders; but in doing this must observe, that though it be quite possible to group genera into orders, and to place these orders into one of the great divisions above given, it is almost impracticable to place them satisfactorily one after the other so as to constitute a book. Each order is not allied merely to the one that precedes and that which follows it, but approaches more or less to several others. In arranging them, then, in a linear series, all that we can attempt is to place those next each other that have common characters of most value or of greatest number; and as the value and number of these are added to or diminished by the discovery of new plants and modern analyses, we must expect daily changes to take place. In this consists the difficulty of the natural method, when compared with a purely artificial one; but these difficulties are from time to time smoothed down, so that ultimately it will be viewed as the only useful one, while the artificial system will be almost entirely neglected, except by those whose desires extend no farther than to make out the name of a vegetable.

Jussieu considered the whole floral envelopes of the Monocotyledones as a calyx, whether coloured or green; and observing that a portion of the Dicotyledones were also destitute of a corolla, he laid hold of this to divide them into two parts, as had been already done by Tournefort: at the same time he separated those with a corolla into one and many-petaled. These sections, however, being artificial, cannot be entirely depended on in practice, many species belonging to a polypetalous order having the corolla abortive; while again, as in the Pentapetaloideæ of Ray, several of those with a polypetalous corolla have the ungues or claws united, so that it is in reality a monopetalous one, although arranged with the other. Linnæus had already introduced the mode of insertion of the stamens to distinguish his class Icosandria from Polyandria; and such bringing together plants tolerably nearly allied in other respects, Jussieu extended the idea, and having observed that stamens not hypogynous were either perigynous or epigynous, he made use of these three characters to subdivide both the Monocotyledones and each of the sections of the Dicotyledonous plants. Only one of these he found necessary further to divide, in order to separate the class Syngenesia of Linnæus from those approximated to it in several other characters, but of a different habit or appearance, and had here recourse to the union or separation of the anthers. These ultimate subdivisions he termed classes, and to the end of them he appended one consisting of such Dicotyledones as had the flowers unisexual, and were therefore principally contained in the 21st, 22d, and 23d classes of Linnæus. We may here remark, that the stamens and corolla have always the same insertion, and that when a corolla is gamopetalous, or, in common language, monopetalous, the

Digitized by Google

cause that unites the petals often also makes part of the filaments adhere to it. Among the monopetalous plants, then, to prevent confusion, Jussieu, instead of saying that the stamens were hypogynous or perigynous, speaks of the insertion of the corolla; and, with these remarks, we may now present the fifteen classes of Jussieu.

I.—COTYLEDONS none.

Class 1. *Acotyledones.*

II.—MONOCOTYLEDONES.

2. *Monohypogynæ,* stamens hypogynous.
3. *Monoperigynæ,* stamens perigynous.
4. *Monoepigynæ,* stamens epigynous.

III.—DICOTYLEDONES.

§ 1. APETALÆ.

5. *Epistamineæ,* stamens epigynous.
6. *Peristamineæ,* stamens perigynous.
7. *Hypostamineæ,* stamens hypogynous.

§ 2. MONOPETALÆ.

8. *Hypocorollæ,* corolla hypogynous.
9. *Pericorollæ,* corolla perigynous.
10. *Epicorollæ synantheræ,* corolla epigynous, anthers united.
11. *Epicorollæ corisantheræ,* corolla epigynous, anthers free.

§ 3. POLYPETALÆ.

12. *Epipetalæ,* stamens epigynous.
13. *Peripetalæ,* stamens perigynous.
14. *Hypopetalæ,* stamens hypogynous.

§ 4. DICLINES.

15. *Diclines,* flowers unisexual, or without a perianth.

Such was the groundwork of the system which, though in some respects artificial, was instantly perceived to bear the palm from all that preceded it; and this, without any alteration, is still adhered to in France by many of the most eminent botanists. Jussieu originally prefixed no names to his classes, and the want of this was much objected to. Those which we have given have been lately proposed by Antoine L. de Jussieu in the *Dictionnaire des Sciences Naturelles;* and, although not entirely in unison with the principles of the Greek language, may be adopted as extremely useful, each being so framed as to suggest the structure of the class. Thus the commencement *Mono,* indicates the Monocotyledones. *Epistamineæ,* &c. having in no part any allusion to a corolla, suggests its absence. *Hypocorollæ,* and the others, allude to the

Digitized by Google

corolla being of one piece, and not of distinct petals, which last is pointed out by names, *Epipetalæ*, &c. The other parts of the names, epi (*upon*), peri (*around*), and hypo (*under*), need no farther explanation.

While engaged in the study of plants alone, it is obviously of little consequence whether we begin, as Jussieu did, by the Acotyledones, or by the Dicotyledones; but if we view botany as a science that treats of only one of the great kingdoms of nature, and wish to introduce it into a *Systema Naturæ*, we must bring those portions of each most closely together which are most nearly linked. So that if we commence by Zoology, we must first describe the Mammalia, and end by those of a simpler structure, and then take up the most allied of the Acotyledones, and follow the steps of Jussieu. But if we describe vegetables in the first place, we must begin with the Dicotyledones, and finish with the Acotyledones. When, however, a *Systema vegetabilium* is contemplated without reference to animals, it may perhaps smooth the way to the student if it commence by those more obvious, and, though of more complex formation, yet more simple to be comprehended. On this account De Candolle has reversed the arrangement of Jussieu.

We have said that in some respect the system of Jussieu is artificial, and therefore his orders need not necessarily follow each other precisely as he has left them. De Candolle accordingly divides the Dicotyledones into *Thalamifloræ*, or those whose petals are distinct and hypogynous; *Calyciflorœ*, having the petals either distinct or united, but always inserted on the calyx; *Corolliflorœ*, with the petals united, and hypogynous, and bearing the stamens; and *Monochlamydeæ*, with a simple perianth or perigonium. Moreover, he derives his characters for all these united, not from the cotyledones, but from the structure of the stem, and terms them Exogenæ; and in a similar way he calls Monocotyledones by the name of Endogenæ, with this alteration, that he supposes the ferns and allied plants, which we have termed Ductulosæ, to have the same structure of a stem as the Monocotyledones, and therefore divides the Endogenæ into *Phanerogamæ* and *Cryptogamæ*. The other Acotyledones named by him *Cellulares*, from their entire homogeneity of cellular tissue, conclude the system.

We ourselves shall follow pretty closely that given by De Candolle, because, from his publishing a book containing all the known species arranged according to it, it is almost the only one that can be of use to a student of species. But while we do so, we shall subdivide his groups in the manner recommended by Jussieu: this will assist the inexperienced botanist in referring to the orders, but must not be implicitly trusted to; thus among the orders with several petals, examples occur in which the petals are united, and others where they are quite abortive; in some orders with hypogynous stamens, genera may occasionally be

Digitized by Google

mentioned with the stamens perigynous: but these anomalies are not more exceptionable than in the Linnean system, where genera meet at every step containing species with a very variable number of stamina and pistilla, and which therefore ought strictly to be inserted in widely different classes and orders. We shall depart also from De Candolle's views in another respect, and retain the Cryptogamous vegetables as an entire division. The following is a sketch of the arrangement we have adopted in the present work.

A. DICOTYLEDONES, *Jussieu.*—EXOGENÆ, *De Candolle.*

I. THALMIFLORÆ, *DC.*—Cl. 1. Hypopetalæ, *Juss.*

II. CALYCIFLORÆ, *DC.*

Cl. 2. Peripetalæ, *Juss.*
3. Epipetalæ, *Juss.*
4. Epicorollæ corisantheræ, *Juss.*
5. Epicorollæ synantheræ, *Juss.*
6. Pericorollæ, *Juss.*

III. COROLLIFLORÆ, *DC.*—Cl. 7. Hypocorollæ, *Juss.*

IV. MONOCHLAMYDEÆ, *DC.*

Cl. 8. Hypostamineæ, *Juss.*
9. Peristamineæ, *Juss.*
10. Epistamineæ, *Juss.*
11. Diclines, *Juss.* { § 1. Angiospermiæ. § 2. Gymnospermæ.

B. MONOCOTYLEDONES, *Juss.*—ENDOGENÆ PHANEROGAMÆ, *DC.*

Cl. 12. Monoepigyneæ, *Juss.*
13. Monoperigynæ, *Juss.*
14. Monohypogynæ, *Juss.*

C *. Cl. 15. ACOTYLEDONES, *Juss.*

§ 1. Ductulosæ, *Arn.*—Endogenæ Cryptogamæ, *DC.*
§ 2. Eductulosæ, *Arn.*—Cellulares, *DC.*

* Between the Monocotyledones and Acotyledones, Schott and Endlicher have lately instituted a fourth division, under the name of Rhizantheæ, to comprehend those parasitical plants which have a truly cellular stem and a homogeneous seed, but at the same time flowers with stamens and pistils. This group has been admitted by Mr Lindley in his Nixus Plantarum. Some of the genera belonging to it have however, although the stem be cellular, bracteas with a structure similar to the Dicotyledones, and, on the other hand, several plants which no one would think of removing from the Dicotyledones, as *Eugenia* and *Penæa*, have the cotyledones conferruminated, or, in other words, the seed perfectly simple as in the Acotyledones.

Digitized by Google

In the second volume we shall, if space permit, give a Linnean key to the genera, and a few short observations on their geographical distribution.

EDINBURGH, *March* 20. 1834.

Digitized by Google

PRINCIPAL ABBREVIATIONS EMPLOYED IN THIS VOLUME.

Ainsl. mat. med. Hind.—The first edition of Dr Ainslie's Materia Medica of the Hindoos, contains some valuable remarks by Dr Rottler.

Andr. bot. rep.—The Botanist's Repository, by Henry Andrews.

Ann. bot.—Annals of Botany, by Koenig and Sims.

Ann. mus.—Annales du Museum.

Ann. sc. nat.—Annales des Sciences Naturelles.

Barrel. ic.—Plantæ per Galliam, Hispaniam et Italiam observata, by J. Barrelier. Edited by Ant. de Jussieu.

Benth.—M. Bentham arranged Dr Wallich's Balsamineæ, Labiatæ, Melastomaceæ, &c.; he is at present engaged with a laborious monograph of the Labiatæ of the whole world.

Blum.—C. L. Blume is the author of the Flora Java *(Fl. Jav.)*, and Bijdragen tot de Flora van Nederlandsche Indië *(Bijdr. Ned. Ind.)*, besides other works.

Bot. mag.—Curtis' Botanical Magazine; formerly conducted by Sims, now by Dr Hooker.

Bot. reg.—Ker's Botanical Register, now conducted by Professor Lindley.

Brongn.—Adolphe Brongniart: his memoir on the Rhamneæ is what we have referred to.

Br. (or *R. Br.*)—Robert Brown, Esq., the first botanist of this or of any other age: his publications are too numerous to be detailed.

Burch.—William J. Burchell, Esq., an eminent South African traveller and botanist.

Burm. Ind.—Flora Indica, by N. L. Burmann.

Burm. Zeyl.—Thesaurus Zeylanicus, by John Burmann.

Camb.—J. Cambessédes, the author of some valuable papers in the Memoirs du Museum: as those on Sapindaceæ, Elatineæ, &c.

Cav. diss.—Monadelphiæ classis dissertationes decem, by Ant. Jos. Cavanilles.

Cham. and Schlecht.—Adalb. v. Chamisso and Dietr. v. Schlechtendal have published conjointly some excellent botanical papers in the Linnæa, a journal edited by the latter.

Chois.—J. D. Choisy, who elaborated the Hypericineæ and Guttiferæ for De Candolle's Prodromus, and is at present engaged with the Convolvulaceæ for the same.

Colebr.—Henry T. Colebrooke, Esq. has published several memoirs in the

Digitized by Google

Linnean Society's Transactions, and in the Asiatic Researches: some of his botanical discoveries are noticed in Roxburgh's Flora Indica.

Corr.—Jos. Correa de Serra, the author of some acute botanical papers.

Coult.—Thom. Coulter, Esq.; he described the Dipsaceæ for De Candolle's prodromus.

DC. Prof. Aug. Pyr. DeCandolle, well known as an accomplished and indefatigable botanist: the principal works published by him, to which we have had occasion to refer, are the Regni Vegetabilis Systema Naturale *(reg. veg.)*, Prodromus Systematis Naturalis Regni Vegetabilis *(prod.)*, Plantes Grasses *(pl. gr.)*, and Plantes rares du jardin de Geneve *(pl. rar. hort. Gen.)*

DC. (Alph.)—Alphonse DeCandolle, son to the above mentioned; he is the author of a short memoir on Dr Wallich's Anonaceæ, and of a Monograph of the Campanuleæ.

Denh. & Clapp. trav.—Travels in Africa by Captains Denham and Clapperton: the Botanical appendix is from the pen of Mr Brown.

De Less. ic. sel.—Icones selectæ Plantarum, quas in Systemate Naturali descripsit DeCandollius, by Baron Benj. DeLessert.

Desr.—Desrousseaux; he wrote several articles for Lamarck's Encyclopedie.

Desv.—N. A. Desvaux, a French botanist, author of the Journal de Botanique, and several interesting papers in the Annales de Sc. Nat., &c.

Dill. Elth.—Jo. Jac. Dillenius; his Hortus Elthamensis is here referred to.

Don. prod. fl. Nep.—Prodromus Floræ Nepalensis, by D. Don, Esq.; he has also published many other papers in the Transactions of the Linnæan and Wernerian Societies, and in various periodical works.

Don, (G.) in Mill. dict.—George Don, Esq. brother to the above mentioned, is the editor of a new edition of Miller's Dictionary, arranged according to the natural system: this work contains all the species in De Candolle's Prodromus, and a considerable number of others.

Duch.—Ant. Nicol. Duchesne, author of the Histoire Naturelle des Fraisiers: he also wrote some articles for Lamarck's Encyclopedie.

Dun.—Mich. Felix Dunal, author of the Histoire des Solanum, Solanorum generumque affinium Synopsis, and Monographie de la Famille des Annonacées, besides other memoirs.

Flem.—Dr John Fleming, President of the East India Company's Medical Board in Bengal: he published several papers in the Asiatic Researches.

Gærtn. fr.—Jos. Gærtner, the well known author of the De Fructibus et Seminibus Plantarum, in 2 vols: his son, Car. Frid. Gærtner, has published a supplement, or third volume.

Ging.—Baron Gingins de Lassarez, of Berne, who described the Violariese for De Candolle's Prodromus.

Grah.—Dr Robert Graham, Professor of Botany at Edinburgh, who assisted to name, and has undertaken to describe, Dr Wallich's Leguminosæ.

Ham.—Dr Francis Hamilton (formerly Buchanan); he has published papers in the Linnean Society's Transactions, and elsewhere, besides his Journey to Mysore. Many of the specimens collected by him in the Peninsula were presented to Smith, Banks, and Lambert: those from Nepaul were principally given to Lambert, and form the groundwork of Don's Prodromus: finally, those from the other parts of Bengal were deposited in the

Digitized by Google

East India Company's Museum, and form the third collection mentioned by Dr Wallich (see above at p. xvi.); a corresponding selection from these last, retained for his own use, has, since his death, been presented by the Company to the University of Edinburgh.

H. B. K.—The well known symbols of HUMBOLDT, BONPLAND, and KUNTH, authors of the Nova Genera et Species Plantarum Æquinoctialium Orbis novi.

Herb. Banks.
Klein (or *Madras*).
Rottler.
Smith, &c.
} These allude to the names given to the plant in the Herbaria of the respective botanists mentioned, or to species named by them.

Hook. bot. misc.—Dr W. J. HOOKER, Professor of Botany at Glasgow: the work here referred to is the Botanical Miscellany, in 3 vols., with 153 plates: it is now continued under the title of Journal of Botany. This is only one of the very numerous works published by our excellent friend.

Jack, Mal. misc.—Dr William JACK, a most distinguished botanist, besides other memoirs in the Linnean Society's Transactions, published two highly valuable papers on Penang plants in the Malayan Miscellanies: the extreme difficulty of procuring this work in Europe, has induced Dr Hooker to publish the first part in his Bot. Miscellany; the second is, we believe, to appear in the Journal of Botany.

Jacq.—Professor Nic. Jos. von JACQUIN published many works: those to which we have principally had occasion to refer are, the Hortus Botanicus Vindebonensis (*hort. Vind.*), and his Icones Plantarum Rariorum (*ic. rar.*)

Juss.—Bernard de JUSSIEU was the author of the Genera Plantarum secundum ordines naturales disposita; this is the work to which we have made so frequent reference at the head of the orders and genera. It was revised and made fit for the public eye and published by his nephew Ant. Laur. de JUSSIEU, who has, in addition, given to the world many profound botanical treatises of his own, in various scientific works published in Paris.

Juss. (*Adr.*)—Adrien de JUSSIEU, son of Ant. L. de Jussieu has already elucidated some very difficult natural orders of plants, as the Euphorbiaceæ, Rutaceæ, Meliaceæ, besides various isolated genera.

Koen.—John Gerard KOENIG, whom we have already noticed a few pages back.

Lam.—Jo. Bapt. Monet de LAMARCK, is principally known as the editor of the botanical part of the Encyclopedie Methodique (*enc. meth.*): the plates accompanying that work are usually styled Illustrations de Genres (*Lam. ill.*): his rich Herbarium has been purchased by Professor Roeper of Bale.

Leschenault.—LESCHENAULT de la Tour: we have already mentioned that his collections are being described by De Candolle in his Prodromus.

L'Her.—Char. Louis L'HERITIER de Brutelle: we principally refer to his Stirpes novæ aut minus cognitæ.

Lindl.—Dr J. LINDLEY, Professor of Botany in the London University, author of many valuable works.

Digitized by Google

Linn.—Car. Linnæus, the well known founder of botanical science. We have principally had occasion to refer to his Species Plantarum (*sp.*), Mantissa Plantarum (*mant.*), Flora Zeylanica (*fl. Zeyl.*), and his manuscript notes in Hermann's Herbarium (*herb. Herm.*). His son published a Supplementum Plantarum (*suppl.*), to which we also often allude.

Linn. soc. trans.—Transactions of the Linnean Society of London.

Loefl.—Peter Loefling, an eminent and favourite pupil of Linnæus.

Lour. Coch.—Jo. de Loureiro, author of the Flora Cochinchensis.

Mart.—Carl Phil. Fr. Martius: he has published, besides other minor works, Genera et species Palmarum Brasiliensium, and Nova genera et species Plantarum Brasiliensium, both very splendid.

Mem. mus.—Memoires de Museum d'Histoire Naturelle.

Moon's Ceyl. pl.—This is an excellent and useful catalogue of Ceylon plants: there are no descriptions.

Moris. hist.—Historia Plantarum Universalis, by Robert Morison.

Pers. syn.—Synopsis Plantarum, seu enchiridion Botanicon, by Christ. Henr. Persoon: the more scientific parts of the work were by Louis Cl. Richard.

Pet. Th.—Aubert du Petit-Thouars: Genera nova Madagascarensia is his only work to which we have occasion to allude.

Pluk.—Leonard Plukenet: his works are the Phytographia, Almagestum Botanicum, Mantissa, and Amaltheum.

Poir.—J. L. M. Poiret: he wrote most of Lamarck's Encyclopedie from the 5th volume to the end of the Supplement.

Rafin.—Charles Rafinesque, an American botanist.

Retz, obs.—Fasciculus 1–6 observationum Botanicarum, by And. J. Retz.

Rheed. Mal.—Rheede's Hortus Malabaricus, already noticed by us.

Rich.—Louis Claude Richard was one of the greatest botanists of which France can boast: his son (Achille Richard) has also published several excellent papers, besides editing many of his father's unpublished works.

Roem. and Sch. syst.—Jo. Jac. Roemer and Jo. Aug. Schultes, the authors of the Linnæi Systema Vegetabilium.

Roth, nov. sp.—Alb. Will. Roth's Novæ Plantarum species, præsertim Indiæ Orientalis, is the work here referred to.

Rottl.—Dr Rottler; his names are principally obtained from distributed specimens.

Roxb.—Dr William Roxburgh: we have referred to almost all his works; to the Plants of the coast of Coromandel (*Cor.*), Flora Indica (*fl. Ind.*), and the edition by Carey and Wallich (*fl. Ind. ed. Wall.*), to the Catalogue of the Calcutta Garden (*hort. Bengh.*), and to the copies (belonging to Professor Hooker) of his unpublished drawings in the East India Company's Museum (*in E. I. C. mus. tab.*).

Ruiz and Pav.—Hipp. Ruiz and Jos. Pavon, authors of the Flora Peruviana et Chilensis.

Rumph. Amb.—Herbarium Amboinense, by G. Ev. Rumphius.

Salis.—Richard Anthony Salisbury, Esq. who wrote several botanical papers.

Schrad.—Professor H. Adolph. Schrader, author of various works.

Schult. syst.—Jos. Aug. Schultes, and Jul. Herm. Schultes, are engaged in continuing the Systema commenced by Roem. and Sch.

Digitized by Google

Ser.—N. C. Seringe, who has elaborated several difficult tribes in De Candolle's Prodromus.

Sm. in Rees' cycl.—Sir James Edward Smith published some valuable Notes on the Linnean Herbarium, of which he had become the possessor, and on Indian plants, in Rees' Cyclopedia.

Sonn. voy. Ind.—Voyages aux Indes Orientales et à la Chine, by Pierre Sonnerat.

Spr.—Professor Sprengel: we principally refer to his Systema Vegetabilium (*syst.*), with the Curæ posteriores (*app.* or *suppl.*), and his Plantarum minus cognitarum Pugillus (*pug.*).

St. Hil.—Aug. St. Hilaire, one of the most eminent French botanists of the present day.

Thunb.—Carl. Petr. Thunberg: sometimes we refer to his Flora Japonica, sometimes to his papers in the Linnean Society's Transactions. He published many other botanical treatises.

Tourn.—Jos. Pitt. de Tournefort: the work which we have occasion to quote, is the Institutiones rei Herbariæ.

Vahl, Professor Martin Vahl: we refer frequently to his Symbolæ Botanicæ (*symb.*), and to his Enumeratio Plantarum (*enum.*): we occasionally also have had to consult his papers in the Skrifter af Naturhistorie-Selskabet of Copenhagen. The sixth volume of this last work is very scarce, and of great value as to Indian plants; Dr Hooker's copy is the only one which we have seen; none of the French or German naturalists appear ever to have met with it.

Ventn.—Steph. Pierre Ventenat, an eminent French botanist.

Wall.—Dr Nath. Wallich, Superintendent of the Botanic Garden of Calcutta: we have already mentioned his works; those we refer to are his Plantæ Asiaticæ rariores (*pl. As. rar.*), his List of East India Plants (*Wall. L.*), and his Tentamen Floræ Nepalensis (*tent. fl. Nep.*)

Wern. soc. trans.—Memoirs of the Wernerian Society of Edinburgh.

Wight cat.—Catalogue of dried specimens of plants distributed by Dr Robert Wight.

W. & A.—These initials denote that we ourselves have either found it necessary to change the former name, or have given one to the plant if new.

Willd.—Professor Christ. Lud. Willdenow of Berlin. The Linnæi Species Plantarum (*sp.*), and Enumeratio Plantarum horti Berolensis (*enum.*), are almost the only works which we have had occasion to quote.

! after an author's name, denotes that we have authenticated the synonym by an inspection, either of the specimen described or of one derived from the same source.

† before the name of a species, indicates that it is involved in obscurity.

* before the name of a species, marks it as a doubtful native of the Peninsula.

Digitized by Google

Digitized by Google

PRODROMUS FLORÆ
PENINSULÆ INDIÆ ORIENTALIS.

Digitized by Google

Digitized by Google

A. DICOTYLEDONES,

OR

EXOGENÆ.

I. THALAMIFLORÆ, *DC.*—Cl. 1. Hypopetalæ, *Juss.*

Calyx of several sepals that are sometimes combined at the base. Petals several, distinct or rarely united, sometimes abortive or wanting; usually hypogynous or inserted upon the receptacle. Torus usually free from the calyx. Stamens inserted with the petals.

ORDER I.—RANUNCULACEÆ. *Juss.*

Sub-ord. 1. Ranunculineæ (*Arn.*) Sepals distinct, various in number, from 3 to 15, but usually 5, deciduous: æstivation generally imbricative, sometimes valvular. Petals hypogynous, 5–15 (or absent by abortion), distinct. Stamens hypogynous, distinct, indefinite in number: anthers adnate, extrorse. Ovaria seated on the torus, indefinite, or rarely (by abortion) solitary, usually distinct, rarely somewhat united: style one to each ovary, simple: ovules solitary? or several, adhering to the inner edge. Carpels various, either achenia which are sometimes baccate, or follicular with 1–2 valves. Albumen between fleshy and horny. Embryo minute, inclosed in the albumen near its base.—Herbaceous, suffrutescent, or rarely shrubby plants. Leaves alternate, or sometimes opposite, variously divided: petiole dilated, and forming a sheath half-clasping the stem. Hairs, when present, simple.

I. CLEMATIS. *Linn.; Lam. ill. t. 497; Gærtn. fr. t. 74.*

Involucre none or resembling a calyx, and placed under the flower. Sepals 4–8, coloured, in æstivation either valvate or with their edges bent in-

Digitized by Google

wards. Petals none, or shorter than the sepals. Stamens numerous. Achenia several in each flower, terminated by a long tail. Seed erect.—Perennial plants with opposite leaves, which are simple, trifoliate, or once or twice pinnate with a terminal leaflet.

In the following there is neither involucre nor corolla: the flowers are panicled, and the tail of the achenia feathery.

1. (1) C. *Gouriana* (Roxb.:) climbing: leaves pinnate or bipinnate; leaflets ovate-lanceolate, acuminated, cordate at the base, 3- or obscurely 5-nerved, entire or with a few coarse serratures: young branches angled, and peduncles, and oblong achenia pubescent: sepals revolute.—*α*; Leaves nearly glabrous, or with the nerves pubescent on the under side.—*Wight! cat. n.* 1, 2.*a*, 3–5.—C. Gouriana, *Roxb. fl. Ind.* 2. *p.* 670; *DC. prod.* 1. *p.* 3; *Spr. syst.* 2. *p.* 668; *Wall.! L. n.* 4673 (excl. *f.*)—C. indica, *Heyne! in Roth. nov. sp. p.* 252.—*β*; Young leaves pubescent or tomentose on the under side.—*Wight! cat. n.* 2.*b.*—C. Gouriana, *Wall.! L. n.* 4673. *f.*——On the Dindygul-hills and Neelgherries.

† 2. (2) C. *triloba* (Heyne:) climbing: lower leaves simple, middle ones 3-lobed, upper of 3 leaflets; leaves and leaflets ovate-lanceolate, pubescent, entire: young branches and peduncles tomentose: panicle somewhat corymbose: sepals oblong-lanceolate, mucronate.—*Roth. nov. sp. p.* 251; *DC. prod.* 1. *p.* 8; *Spr. syst.* 2. *p.* 668.

Probably badly described, and the same with our *C. Gouriana β.*

3. (3) C. *Wightiana* (Wall.:) climbing: leaves pinnate; leaflets not wrinkled, very villous and soft on both sides, coarsely serrated, cordate at the base, palmately 3-lobed, the middle lobe the longest, or divided again into 3 ovate-lanceolate segments: young branches, peduncles, and flat achenia, pubescent: sepals ovate, outside very pubescent, inside glabrous: filaments hairy.—*Wall.! L. n.* 4674; *Wight! cat. n.* 6.——Neelgherries. Low hills on the banks of the Kestnah near Bezwarah in the northern Circars.

II. NARAVELIA. *DC.*

Involucre none. Sepals 4–5, valvate in æstivation. Petals 6–12, linear, thickish, longer than the calyx. Stamens numerous. Achenia several in each flower, furnished with a short stalk about as thick as the achenium. Seed erect.—Perennial climbing plants. Leaves opposite, consisting of two leaflets with an intermediate tendril.

4. (1) N. *Zeylanica* (DC.:) leaflets broadly ovate, shortly acuminated: achenia spirally twisted, hairy, with a long feathery tail; stalk longer than broad, glabrous.—*DC. prod.* 1. *p.* 10; *Wall.! L. n.* 4687; *Wight! cat. n.* 7.—Atragene Zeylanica, *Linn.; Roxb. Cor.* 2. *t.* 188; *fl. Ind.* 2. *p.* 670; *Spr. syst.* 2. *p.* 644.

Leaves usually densely pubescent on the under side: in specimens from Prome they are quite glabrous.

III. THALICTRUM. *Linn.; Lam. ill. t.* 497.

Involucre none under the flower. Sepals 4–5, imbricated in æstivation. Petals none. Stamens numerous. Achenia several, without a tail, sometimes stalked, sometimes longitudinally furrowed. Seed pendulous.—Stems herbaceous, never climbing. Leaves usually divided in a thrice-ternate manner, alternate; petiole with a dilated base.

5. (1) T. *glyphocarpum* (W. & A.:) flowers bisexual: leaves triternate; the sheaths at their base reniform, 3-lobed, fringed; stipellæ none at the divisions of the petiole; leaflets wedge-shaped, roundish, slightly cordate at

Digitized by Google

the base, glabrous, coarsely toothed, teeth rounded and tipped with a point: panicles few-flowered; flowers bisexual: filaments slightly club-shaped: anthers linear-oblong, awnless: ovaries 15–20: achenia stalked, erect, deeply furrowed, terminated by the hooked persistent style.—*Wight! cat. n.* 8.——Sent from the mountains, but it is uncertain whether from the Neelgherries or the Dindygul range.

IV. ANEMONE. *Linn.; Lam. ill. t.* 496; *Gærtn. fr. t.* 74.

Involucre 3-leaved, distant from the flower, the leaflets variously cut. Sepals 5–15, petaloid, imbricated in æstivation. Petals [illegible] Stamens numerous. Achenia numerous. Seed pendulous.—Herbaceous plants with a perennial root. Leaves radical, stalked, more or less cut or lobed. Scape, when branched, bearing involucres at each of its divisions.

The following belong to a section called *Anemonospermos*, in which the achenia are slightly compressed, and have no feathery tail; several pedicels spring from the involucre, one of them naked, the others with a 2- or rarely 3-leaved involucel, and are sometimes again similarly divided.

6. (1) A. *dubia* (Wall.:) clothed with silky hairs: leaves tripartite; divisions deeply 3-cleft; segments cuneate-ovate, bluntish, more or less lobed, sharply serrated: involucral leaves subsessile, deeply 3-cleft; the divisions 3-cleft; segments linear-oblong, cut and serrated: sepals about 7, cuneate-ovate, obtuse: achenia glabrous: style hooked, persistent.—*Wall.! L. n.* 4698; *Wight! cat. n.* 10.——Neelgherries.

7. (2) *Wightiana* (Wall.:) clothed with silky hairs: leaves on very long petioles, tripartite; divisions very deeply 3-cleft; segments cuneate, deeply 3-lobed; lobes cuneate, irregularly inciso-serrated: involucral leaves subsessile, deeply 3-cleft; divisions 3-cleft; segments linear-oblong, cut and serrated: sepals 6–8, elliptic-oblong: achenia glabrous: style hooked, persistent.—*Wall.! L. n.* 4697; *Wight! cat. n.* 9, 11.——Neelgherries.

Much larger and coarser in all its parts than the last: future observations may, however, prove them to be the same species.

V. ADONIS. *Linn.; Lam. ill. t.* 498; *Gærtn. fr. t.* 74.

Involucre none. Sepals 5, erect, sometimes free at the base externally, imbricated in æstivation. Petals 5–15, the claw naked. Stamens numerous. Achenia numerous, arranged upon the more or less elongated receptacle, tipped with the short style. Seed pendulous.—Herbaceous caulescent plants. Cauline leaves pinnate, divisions multifid, segments linear and very numerous. Flowers solitary at the extremity of the stem or branches, yellow or red, never blue.

8. (1) A. *æstivalis* (Linn.:) annual: petals oblong, obtuse; achenia glabrous, wrinkled, arranged in an elongated spike: style straight.—*DC. prod.* 1. *p.* 24; *Spr. syst.* 2. *p.* 645; *Wight! cat. n.* 12.——Neelgherries.

VI. RANUNCULUS. *Linn.; Lam. ill. t.* 498; *Gærtn. fr. t.* 74.

Sepals 5, not free at the base, deciduous, imbricated in æstivation. Petals 5, rarely 10 or more, the claw furnished inside with a nectariferous concave little scale. Stamens and styles numerous. Achenia ovate, pointed, somewhat compressed. Seed erect.—Herbaceous plants with annual or perennial roots. Leaves mostly radical; cauline ones placed at the base of the branches and peduncles.

9. (1) R. *reniformis* (Wall.:) erect, hairy: radical leaves roundish ovate,

Digitized by Google

rounded or somewhat cordate at the base, coarsely crenated; lowest scape-leaf oblong, toothed, narrowed at the base into a petiole; upper ones nearly linear: petals (yellow) numerous, 10–13, twice as long as the patulous calyx: heads of fruit globose: achenia oblong, tumid, minutely dotted: style nearly straight.—*Wall.! L. n.* 4709; *Wight! cat. n.* 14.——Neelgherries.

10. (2) R. *subpinnatus* (W. & A.:) diffuse, branched, hairy: radical and lower cauline leaves tripartite, lateral divisions sessile, middle one stalked, all deeply 3-cleft, segments cut and serrated; middle leaves resembling the middle division of the radical leaf; upper 3-cleft, inciso-serrated: petals (yellow) twice as long as the reflexed? villous calyx: heads of fruit globose: achenia roundish, lenticular, minutely dotted, thick at the back, the marginal nerves inconspicuous: style short, straight.—*Wight! cat. n.* 15.

Allied to *R. acris*, Linn.

11. (3) R. *Wallichianus* (W. & A.:) perennial: stem glabrous, diffuse, prostrate, with a tendency to root at the joints, and bearing there several leaves: leaves and petioles hairy; radical leaves trifoliate, leaflets petioled, 3-cleft, segments somewhat ovate lobed and inciso-serrated: peduncles hairy, scarcely longer than the petioles: petals (yellow) about as long as the calyx: heads of fruit globose: achenia roundish, compressed-lenticular, minutely dotted, tuberculated: style broad, hooked at the apex.—*Wight! cat. n.* 16.——Neelgherries.

Its nearest affinity is with *R. pinnatus*, Poir., and *R. trilobus*, Desf.

VII. DELPHINIUM. *Linn.; Lam. ill. t.* 432; *Gærtn. fr. t.* 65.

Calyx deciduous, petaloid, irregular, the upper sepal produced downwards into a kind of spur; æstivation imbricative. Petals 4, sometimes united, the two upper produced at the base into appendages (or inner spur) contained within the spur of the calyx. Stamens numerous. Capsules follicular, 1–5 in each flower, distinct, 1-valved. Seeds several.—Stems herbaceous. Leaves alternate, palmately multifid. Flowers racemose; each pedicel with one bractea at its base, and two between that and the flower.

12. (1) D. *Ajacis* (Linn.:) annual, erect: branches nearly simple, straight, scarcely diverging: lobes of the leaves linear, bluntish: racemes long, dense; pedicels erect, stout, scarcely twice as long as the bractea at their base, which is longer than the others: petals united; inner spur of one piece: capsules solitary, densely pubescent, and calyx spur as long as the pedicel.—*DC. prod.* 1. *p.* 51; *Spr. syst.* 2. *p.* 616; *Wall.! L. n.* 4720. *c.*; *Wight! cat. n.* 18.

13. (2) D. *pauciflorum* (Don:) annual, erect, nearly simple: branches simple, elongated, straight, erect: lobes of leaves linear acuminated: racemes lax; pedicels erect, slender, nearly twice the length of the bractea at their base, which is sometimes multifid, but generally subulate like the others and longer than them: petals united; inner spur of one piece: capsule solitary, slightly pubescent, and calyx-spur twice as short as the pedicel.—*Don. prod. fl. Nep. p.* 196; *Wight! cat. n.* 17.—D. Ajacis, *Wall.! L. n.* 4720. *a, b.*—— Neelgherries.

ORDER II.—DILLENIACEÆ. *DC.*

Sepals 4–5, rarely 12 or 13, persistent. Corolla hypogynous, of 4–5 petals, usually deciduous, in a single row. Stamens hypogynous, generally numerous, sometimes only 5, 7, or 10: filaments dilated either at the base or apex: anthers adnate, introrse, bursting longitudinally, or by two terminal pores. Ovaria definite, more or less distinct, with a

Digitized by Google

terminal style and simple stigma; ovules ascending. Fruit of 1–5 distinct unilocular carpels, or of a similar number cohering together: the carpels are either capsular or baccate, and pointed with the style. Seeds several in each carpel, or only two or one by abortion, with or without a pulpy arillus: testa hard. Embryo straight, minute, at the base of a fleshy albumen.—Leaves alternate, or rarely opposite, without stipules.

I. TETRACERA. *Linn.; Gærtn. fr. t.* 69.

Flowers often by abortion dioecious or polygamous. Stamens numerous: filaments dilated at the apex: cells of the anther distinct, roundish. Capsules 3–5, follicular, surrounded by the imbricated distinct sepals. Seeds 1–5, shining, with an arillus.—Usually climbing shrubs or small trees, with terete branches. Leaves alternate, petioled, entire, quite entire or toothed, coriaceous, evergreen. Flowers panicled.

14. (1) T. *Rheedii* (DC.:) climbing: leaves oblong, sharpened at both ends, quite entire or with a few distant gland-shaped teeth, glabrous and free from roughness on both sides; nerves and reticulated veins somewhat prominent beneath: panicle compact, resembling a corymb: sepals 4, glabrous on the outside and silky within, ciliated: capsules shining, usually by abortion one-seeded.—*α*; racemes many-flowered.—*Wight! cat. n.* 19.—T. Rheedii, *DC. syst.; prod.* 1. *p.* 68; *Spr. syst.* 2. *p.* 629.—Calophyllum Akara, *Burm. Ind. p.* 121.—*Rheed. Mal. 5. t.* 8.—*β*; racemes few-flowered.—*Wight! cat. n.* 20. —T. lævis, *Wall.! L. n.* 6627.——Travancore. Malabar.

T. lævis not very well described by Vahl, must be the same as *T. Malabarica* of Lamarck, from whom he received his specimens: this last name De Candolle changes to *T. Assa*, and Dr Wallich refers to it *T. trigyna*, Roxb. fl. Ind. 2. p. 645.

†15. (2) T? *Heyneana* (Wall. L. n. 6630).

II. DILLENIA. *Linn.; Lam. ill. t.* 492.

Stamens numerous: filaments somewhat attenuated upwards: anthers adnate, elongated. Carpels 5–20, indehiscent, united round a central conical axis into a spurious berry, crowned by as many radiating styles and entire stigmas. Seeds immersed in a gelatinous pulp.—Trees. Leaves oblong, but variable in size and shape on the same individual; always much larger on young plants than on old ones: lateral nerves parallel to each other, usually excurrent and forming sharp teeth or serratures. Petioles with a broad base half embracing the stem. Stipules none. Peduncles arising from a scaly bud. Flowers yellow.

16. (1) D. *pentagyna* (Roxb.:) leaves broadly lanceolate, sharply toothed or serrated, appearing after the flowers: peduncles from the axils of the scars of the former year's leaves, several together, one-flowered, without bracteoles: inner row of stamens longer than the others: styles 5.—*Roxb. Cor.* 1. *t.* 20; *fl. Ind.* 2. *p.* 652; *Ham.! in Lin. Soc. Trans.* 15. *p.* 100; *Wight! cat. n.* 22. —Colbertia Coromandeliana, *DC. prod.* 1. *p.* 75; *Wall.! L. n.* 949.—Wormia Coromandeliana, *Spr. syst.* 2. *p.* 631.——Malabar, and southern provinces.

17. (2) D. *speciosa* (Thunb.:) leaves oblong, serrated, glabrous, appearing with the flowers: peduncles solitary, terminal, one-flowered: stamens all equal in length: styles and carpels about 20: seeds hairy.—*DC. prod.* 1. *p.* 76; *Spr. syst.* 2. *p.* 644; *Roxb. fl. Ind.* 2. *p.* 650; *Wall.! L. n.* 943; *Wight! cat. n.* 21.—D. Indica, *Linn.*—D. elliptica, *Thunb.; DC. prod.* 1. *p.* 76;

Digitized by Google

Spr. syst. 2. *p.* 644.—*Rheed. Mal.* 3. *t.* 38, 39; *Rumph. Amb.* 2. *t.* 45.——Malabar, and southern provinces.

* 18. (3) D. *retusa* (Thunb.:) leaves obovate, retuse, glabrous, very slightly toothed, appearing with the flowers: peduncles terminal, solitary, 1–2 (or 3?–) flowered: stamens of equal length: styles and carpels about 6.—*Th. in Linn. Soc. Trans.* 1. *p.* 200. *t.* 19; *Lam. ill. f.* 492. *f.* 2; *DC. prod.* 1. *p.* 76; *Spr. syst.* 2. *p.* 644; *Wall.! L. n.* 6625; *Wight! cat. n.* 23.——Missionaries' garden; *Klein.*

On the only two specimens we have seen with the peduncles, there are either two flowers, or the scars from which they have fallen off. We should have considered the *D. dentata* of Thunberg, as figured in the Lin. Soc. Trans. 1. t. 20, the same as a three-flowered state of this; but a specimen named by himself in M. De Lessert's herbarium, having convolute glabrous stipules, is *Wormia dentata*, DC., and is perhaps a variety of *W. triquetra*, Rottb. Probably Thunberg, trusting too much to the number of flowers, had both plants in view.

III. ACROTREMA. *Jack.*

Stamens 15, erect: filaments short: anthers adnate, long, linear, opening by two terminal pores. Ovaries 3, distinct, each terminated with a style and simple stigma: ovules two in each cell. Carpels 3, capsular.—Herbaceous low plants. Leaves all radical, oblong-obovate, obtuse, toothed, covered with rigid longish hairs on both sides, but particularly on the midrib and nerves beneath. Petioles short, their margins dilated into membranaceous auricles. Peduncles radical (or scapes), hairy, 8–12-flowered. Flowers pedicellate, racemose. Corolla yellow.

19. (1) A. *Wightianum* (Wall.:) leaves sprinkled with rigid hairs, but otherwise glabrous: lower ovule in each carpel abortive.—*Wall.! L. n.* 3669; *Wight! cat. n.* 24.——Padenaveram in Travancore.

This appears to differ from *A. costatum*, Jack, which is described with leaves not only furnished with rigid hairs, but also tomentose.

ORDER III.—MAGNOLIACEÆ, *Juss.*

Sub-ord. 1. MAGNOLIEÆ (*Juss.*) Sepals 3–6, deciduous. Petals hypogynous, 3–27, in several rows. Stamens hypogynous, indefinite, distinct; anthers adnate, introrse, long, bursting longitudinally, Ovaries numerous in several rows, one-celled: ovules ascending or suspended: styles short. Fruit of numerous carpels, which are either dehiscent or indehiscent, distinct or partially connate, sometimes samaroid. Embryo minute at the base of a fleshy albumen. Leaves alternate, not dotted, coriaceous, with deciduous convolute stipules.

I. MICHELIA. *Linn.; Lam. ill. t.* 493; *Gærtn. fr. t.* 137.

Carpels arranged in a loose spike, of a consistence between leathery and fleshy, 2-valved, opening from the apex downwards. Seeds several (3–8), externally fleshy.—Trees. Leaves entire, petioled. Flowers axillary, generally fragrant, usually of a yellow colour.

20. (1) M. *Champaca* (Linn.:) leaves lanceolate, acuminated, glabrous: flowers on short peduncles: spatha of one leaf: anthers obtuse.—*DC. prod.* 1. *p.* 79; *Spr. syst.* 2. *p.* 643; *Roxb. fl. Ind.* 2. *p.* 656; *Lam. ill. t.* 493; *Wall.! L. n.* 969; *Wight! cat. n.* 25.—*Rheed. Mal.* 1. *t.* 19; *Rumph. Amb.* 2. *t.* 67.

Digitized by Google

ORDER IV.—ANONACEÆ. *Juss.*

Sepals 3–4, persistent, often partially cohering. Petals 6, hypogynous, in two rows, coriaceous; æstivation valvular. Stamens hypogynous, indefinite (very rarely definite): anthers adnate, extrorse, with a large connectivum. Ovaries usually numerous, separate or sometimes cohering, rarely definite: ovules solitary or several, erect or ascending. Fruit of a number of succulent or dry carpella, that are 1- or many-seeded, and distinct, or concrete into a fleshy mass. Testa of the seed brittle. Embryo minute at the base of a hard fleshy or horny ruminated albumen.—Trees or shrubs. Leaves alternate, simple, without stipules.

I. ANONA. *Linn.; Lam. ill. t.* 494; *Gærtn. fr. t.* 138.

Sepals 3, united at the base, somewhat acute. Petals 6; outer 3 thick, not winged at the back; inner ones smaller and sometimes quite abortive. Anthers numerous, nearly sessile, covering the hemispherical torus: connectivum dilated at the apex beyond the anther. Carpels numerous, 1-celled, 1-seeded, united into one scaly, internally pulpy, many-seeded berry.—Aromatic trees or shrubs. Peduncles axillary or opposite to the leaves.

*21. (1) A *squamosa* (Linn.:) stem arborescent: leaves oblong or oblong-lanceolate, bluntish, glabrous, pellucid-dotted: exterior petals narrow-lanceolate, obtuse, concave below, three-cornered near the apex, connivent; inner ones scarcely any: fruit ovoid, scaly.—*DC. prod.* 1. *p.* 85; *Spr. syst.* 2. *p.* 640; *Roxb. fl. Ind.* 2. *p.* 657; *Wall. L. n.* 6490; *Wight! cat. n.* 27.—*Rheed. Mal.* 3. *t.* 29; *Rumph. Amb.* 1. *t.* 46; *Pluk. t.* 134. *f.* 3. (bad).

*22. (2) A. *reticulata* (Linn.:) a tree: leaves oblong-lanceolate, acute, glabrous, minutely pellucid-dotted; exterior petals oblong, connivent, three-cornered towards the apex, concave below; inner minute, smaller than the calyx, obtuse: fruit somewhat globose, reticulately areolate.—*DC. prod.* 1. *p.* 85; *Spr. syst.* 2. *p.* 640; *Roxb. fl. Ind.* 2. *p.* 657; *Wall. L. n.* 6489; *Wight! cat. n.* 26.—*Rheed. Mal.* 3. *t.* 30, 31.

II. LOBOCARPUS. *W. & A.*

Calyx? tubular, 3-cleft, coriaceous, persistent, enclosing the fruit. Carpels 5, unilocular, united into a 5-celled, oblong, cartilaginous fruit shortly and obtusely 5-lobed at the apex: cells at the base of the fruit, each with 2 seeds placed side by side.—Branches woody. Leaves short-petioled, lanceolate, acuminated, glabrous. Flowers 1–3 together, small, nearly sessile in the axils of the leaves: persistent floral-covering externally pubescent, with 2–3 lanceolate glabrous bracteas at its base.

23. (1) L. *Candolleanus* (W. & A.)—*Wight! cat. n.* 56.

III. UVARIA. *Linn.; Lam. ill. t.* 495; *Gærtn. fr. t.* 114.

Sepals 3, united at the base. Petals 6, in a double series, distinct or united at the very base. Stamens numerous, distinct. Ovaries numerous, distinct. Ovules several, arranged in a double row. Carpels baccate, more or less stalked, ovate, oblong, or elongated, indehiscent, even or very slightly torulose, with-

Digitized by Google

in pulpy or with spurious horizontal dissepiments (formed by the hardening of a pulp). Seeds several in each carpel, horizontal, without an arillus.—Trees or shrubs. Stems erect or climbing. Peduncles 1-flowered, solitary or several together, arising from short leafy or leafless shoots of frequently former years' growth.

24. (1) U. *tomentosa* (Roxb.:) a tree: leaves oblong, acute, pubescent on both sides: flower-bearing shoots usually leafy, 1–2-flowered; peduncles opposite to the leaves and half as long, slender, solitary, very pubescent: calycine lobes triangular, acute: three exterior petals minute, linear-subulate; three interior oblong: carpels 10–15, ovoid, on stalks their own length: seeds about 4, separated by a pulp.—*Roxb. Cor.* 1. *t.* 35; *fl. Ind.* 2. *p.* 667; *DC. prod.* 1. *p.* 88; *Spr. syst.* 2. *p.* 659; *Wall.! L. n.* 6472; *Wight! cat. n.* 29.

Our specimens are only slightly pubescent, not tomentose; the flower-shoots also happen to be without leaves, presenting the appearance of one long lateral jointed peduncle.

* 25. (2) U. *odorata* (Lam.:) a tree: leaves oblong-lanceolate, acuminated, glabrous; margins slightly waved: flower-bearing shoots axillary, slightly leafy, stout; peduncles about three, corymbosely placed at the top of the shoot, slender, drooping: calycine lobes ovate-rounded: petals equal, linear-lanceolate: carpels 9–12, ovoid, glabrous, on long stalks: seeds 6–12, flattened, pitted, separated by the greenish pulp.—*Lam. ill. t.* 495. *f.* 1; *Roxb. fl. Ind.* 2. *p.* 661; *Wall.! L. n.* 6457; *Wight! cat. n.* 32.—Unona odorata, *Dun.; DC. prod.* 1. *p.* 90; *Spr. syst.* 2. *p.* 637.—Un. Cananga, *Spr. syst. app. p.* 215. —*Rumph. Amb.* 2. *t.* 65.

The inflorescence is sometimes described thus: peduncle axillary, 3-flowered, at length slightly leafy, with pedicels somewhat corymbose, which arises from different names being given to the same parts.

26. (3) U. *lutea* (Roxb.:) a tree: leaves shortly petioled, oblong or ovate, coriaceous, glabrous, shining above, veins prominently reticulated beneath: flower-bearing shoots opposite to the leaves, leafless, exceedingly short, 1–6 flowered; peduncles short, terminal: calycine lobes ovate, small: petals about equal, oblong, obtuse, much longer than the calyx: carpels 4–6, ovoid, pubescent, stellately placed on very short stalks round the torus: seeds 3–6, separated by pulp.—α; leaves elliptic-oblong.—U. lutea, *Roxb. Cor.* 1. *t.* 36; *fl. Ind.* 2. *p.* 666; *Wight! Cat. n.* 28.—Guatteria acutiflora, *Wall.! L. n.* 6438. *d.*—β; leaves oblong or ovate, obtuse at the base, acuminated.—U. lutea, *Dun.; DC. prod.* 1. *p.* 88; *Spr. syst.* 2. *p.* 639; *Wall.! L. n.* 6462; *Wight! cat. n.* 31. *b.*—U. coriacea, *Vahl symb.* 3. *p.* 72.

Our second variety is certainly the plant of Vahl and of Wallich; Roxburgh's figure and description, however, has the leaves more elliptical, and not acuminated, and agrees pretty well with our α. In our specimens of both, the seeds occupy the whole breadth of the fruit; and not, as Roxburgh figures them, only half the breadth. The flower-shoot might almost be called a peduncle, bearing 1–6 pedicels.

* 27. (4) U. *Heyneana* (Wall.:) leaves almost sessile, oblong-lanceolate, somewhat acute at the base, coriaceous, glabrous, shining above, veins not prominent beneath: flower-bearing shoots lateral, leafy; peduncles terminal, solitary: calycine lobes oblong, nearly the length of the corolla: petals oblong, obtuse, equal: carpels nearly globose, very shortly stalked, pubescent: seeds about 4, shining, separated by pulp, middle ones opposite and only half the breadth of the fruit.—*Wall.! L. n.* 6463; *Wight! cat. n.* 31.—Guatteria montana, *DC. prod.* 1. *p.* 94; *Spr. syst.* 2. *p.* 635.—G. Malabarica, *Dun.* —*Rheed. Mal.* 5. *t.* 17.

There is a specimen, apparently of this species, in the herbarium of the younger Linnæus, unnamed, from Thunberg, and gathered in Java. In Rheede, the calyx is represented too short, but the figure otherwise accords.

Digitized by Google

28. (5) U. *Narum* (Wall.:) shrubby climbing: leaves oblong-lanceolate, glabrous: flower-bearing shoots lateral, leafy; peduncles solitary, terminal: calycine lobes roundish-ovate: petals equal, united at their base!, roundish-ovate, concave, incurved: carpels numerous (30–40), between ovoid and globose, glabrous, very slightly torulose, on long stalks: seeds about 4, flattened, smooth, shining, separated by membranous dissepiments, extending the whole breadth of the carpel; hilum conspicuous, roundish.—*Wall.! L. n.* 6473; *Wight! cat. n.* 33.—U. Zeylanica, *Lam.*; *Willd.*; (not *Linn.*)—Unona Narum, *Dun.*; *DC. prod.* 1. *p.* 89; *Spr. syst.* 2. *p.* 637.—*Rheed. Mal.* 2. *t.* 9.

* 29. (6) U. *grandiflora* (Roxb.:) shrubby, climbing: leaves elliptic-oblong, acuminated, contracted downwards but retuse at the base, nearly sessile, tomentose beneath: flower-bearing shoots opposite to the leaves or above their axils, short, with one or two caducous leaves; peduncles solitary, terminal: calycine lobes broadly ovate, slightly acute: petals about equal, broadly ovate, villous: carpels numerous, cylindrical, with two prominent longitudinal ribs, long stalked: seeds numerous, smooth, shining, separated by dissepiments, extending the whole breadth of the carpel.—*Roxb. fl. Ind.* 2. *p.* 667; *Wall. pl. As.* 2. *t.* 121.—U. purpurea, *Blum. fl. Jav. anon. t.* 1; *Wall.! L. n.* 6485.—Unona grandiflora, *DC. prod.* 1. *p.* 90; *Spr. syst.* 2. *p.* 637.—Funis musarius angustifolius, *Rumph. Amb.* 5. *p.* 78?

The *Unona musaria*, Dun., or *Funis musarius latifolius*, Rumph. Amb. 5. t. 42, appears to us to be referable to *U. macrophylla*, Roxb.

†30. (7) U. *mollis* (Wall. L. n. 6475.)

†31. (8) U. *Russellii* (Wall. L. n. 6464.)

IV. UNONA. *Linn.*

Sepals 3, united at the base. Petals 6, in a double series, or 3. Stamens distinct, numerous. Ovaries numerous, distinct. Ovules several, arranged in a single row. Carpels elongated, usually moniliform, rarely cylindrical at the base and irregularly contracted above, many-celled, indehiscent. Seeds numerous (or few by abortion), usually solitary in each articulation, attached to the bottom of the cell by a minute ovate hilum, ovoid, shining, without an arillus.—Trees or shrubs. Peduncles 1-flowered, solitary, springing from the extremity of a shoot that is either with or without leaves. Petals increasing in size after expansion.

32. (1) U. *discolor* (Vahl:) leaves ovate or lanceolate, acute or acuminated, somewhat cordate at the base; upper side glabrous; under slightly hairy and glaucous: flower-bearing shoots lateral, short, with a small terminal bractea-like leaf: calycine lobes lanceolate, long-acuminated: petals 6, lanceolate, the inner ones the smaller: fruit-bearing torus not incrassated: carpels regularly moniliform: seeds erect.—*Vahl symb.* 2. *p.* 63. *t.* 36; *DC. prod.* 1. *p.* 91; *Spr. syst.* 2. *p.* 658; *Roxb. fl. Ind.* 2. *p.* 669; *Wall. L. n.* 6420.—U. Lessertiana, *Dun. anon. t.* 26; *DC. prod.* 1. *p.* 90; *Spr. syst.* 2. *p.* 637.—U. Chinensis, *DC. prod.* 1. *p.* 91.—Uvaria monilifera, *Gærtn. fr. t.* 114.—Desmos Chinensis, *Lour.*

The flower-shoots here resemble a lateral 1-bracteated peduncle, and are usually so described.

V. ARTABOTRYS. *Brown.*

Sepals 3, united at the base. Petals 6, contracted a little above their base. Stamens numerous. Torus convex. Ovaries 3, or numerous, distinct. Ovules 2, collateral, inserted at the base. Stigmata obtuse, united. Carpels few, baccate, indehiscent, shortly stalked, one-celled. Seeds 2 (or by abortion solitary) in each carpel, collateral, erect, without an arillus.—Climbing shrubs.

Digitized by Google

Peduncles one-flowered, arranged on the one side of short hooked shoots or branchlets. Flowers fragrant.

33. (1) A. *odoratissimus* (Br.:) leaves ovate or oblong, lanceolate, glabrous, shining: peduncles glabrous: petals narrow-oblong, clothed with a rusty pubescence: carpels pyriform.—*Br. in Bot. Reg. t.* 423; *Spr. syst.* 2. *p.* 636; *Wall.! L. n.* 6415; *Wight! cat. n.* 34.—Uvaria odoratissima, *Roxb. fl. Ind.* 2. *p.* 666.—U. uncata, *Roxb. fl. Ind.* 2. *p.* 666. (kept distinct from *U. odoratissima* by mistake of the printer).—U. esculenta, *Rottl.*—Unona uncinata, *Dun. anon. t.* 12; *DC. prod.* 1. *p.* 90.—U. esculenta, *Dun.*; *DC. prod.* 1. *p.* 90.—Anona hexapetala, *Linn.*—A. uncinata, *Lam.*—*Rheed. Mal.* 7. *t.* 46.

VI. MILIUSA. *Lesch.; Alph. DC.*

Sepals 3, united at the base, subulate, reflexed. Petals united into a three-lobed campanulate corolla. Stamina about 12: filaments slender, elongated: anthers minute. Torus ovoid. Ovaries numerous, distinct. Ovules 2 in each, one above the other. Carpels distinct.—A woody plant with slender branches. Leaves elliptic, entire, slightly hairy. Flowers axillary, solitary, on very short peduncles.

34. (1) M. *Indica* (Lesch.)—*Alph. DC. anon. p.* 37. *t.* 3; *Wall. L. n.* 5433.—Uvaria ciliata, *Heyne mss.*

VII. GUATTERIA. *Ruiz and Pav.*

Sepals 3, united at their base. Petals 6. Anthers numerous, nearly sessile. Carpels distinct, numerous, somewhat baccate, ovate or globose, stalked, one-seeded.—Trees or shrubs. Peduncles 1-flowered, springing from an axillary or lateral, leafy or leafless shoot or branchlet (peduncle of most authors).

35. (1) G. *longifolia* (Wall.:) a tree: leaves linear-lanceolate, acuminated, undulated at the margin, glabrous, shining: peduncles long and slender, fascicled along the short lateral leafless shoots: petals equal, narrow lanceolate, acuminated, undulated: carpels ovoid.—*Wall.! L. n.* 6442; *Wight! cat. n.* 35.—Uvaria longifolia, *Lam.*; *Roxb. fl. Ind.* 2. *p.* 664.—Unona longifolia, *Dun.*; *DC. prod.* 1. *p.* 90; *Spr. syst.* 2. *p.* 637.——Commonly cultivated, but wild in Tanjore.

Berries certainly only 1-seeded.

36. (2) G. *cerasoides* (Dun.:) a tree: leaves oblong or lanceolate, acute, pubescent beneath: flower-bearing shoots almost abortive, lateral, leafless; peduncles solitary, terminal, with one or two bracteas at their base: calycine lobes nearly as long as the corolla: petals equal, oval oblong, thick: carpels globose, on stalks nearly twice their length.—*DC. prod.* 1. *p.* 93; *Spr. syst.* 2. *p.* 635; *Wall.! L. n.* 6436; *Wight! cat. n.* 38.—Uvaria cerasoides, *Roxb. Cor.* 1. *t.* 33; *fl. Ind.* 2. *p.* 666.

37. (3) G. *suberosa* (Dun.:) a tree: leaves nearly sessile, oblong or elliptic-oblong, glabrous; margin waved: flower-bearing shoots leafy; peduncles solitary, somewhat opposite to the leaves, drooping: three outer petals ovate, resembling the calyx; three inner twice as long, oblong lanceolate: carpels globose, mucronate, on stalks about twice their length.—*DC. prod.* 1. *p.* 93; *Spr. syst.* 2. *p.* 635; *Wall.! L. n.* 6437; *Wight! cat. n.* 36.—Uvaria suberosa, *Roxb. Cor.* 1. *t.* 34; *fl. Ind.* 2. *p.* 667.

38. (4) G. *Korinti* (Dun.:) shrubby, climbing: leaves ovate-oblong, acuminated, coriaceous, glabrous; upper side shining, under prominently reticulated with veins: flower-bearing shoots elongated, leafy, with several flowers; peduncles axillary, solitary, pubescent: petals equal, about twice as long as

Digitized by Google

the calyx, elliptic-oblong, obtuse, margins recurved: carpels 6–12 globose, on stalks longer than themselves.—*DC. prod.* 1. *p.* 94; *Spr. syst.* 2. *p.* 635; *Wight! cat. n.* 30, 37.—G. acutiflora, *Wall.! cat. n.* 6438. *a.*—*Rheed. Mal.* 5. *t.* 14.——Province of Tanjore in moist rich soil.

† 39. (5) G. *sempervirens* (Dun.:) shrubby: leaves ovate-oblong, acuminated, coriaceous, glabrous, shining: flower-bearing shoots short, 1–2-leaved, 1-flowered; peduncles woolly: calyx minute: petals somewhat equal, oblong, pointed: carpels about 9, globose, on stalks about their own length.—*DC. prod.* 1. *p.* 94; *Spr. syst.* 2. *p.* 635.—*Rheed. Mal.* 5. *t.* 16.——Malabar, especially in Angiccaimaal.

† 40. (6) G. *acutiflora* (Dun.:) shrubby: leaves ovate-oblong, acute, coriaceous, glabrous, upper side shining: flower-bearing shoots short, 1–2-leaved, 1-flowered; peduncles short: calycine lobes obtuse: petals equal, oblong, very acute, twice as long as the calyx.—*DC. prod.* 1. *p.* 94; *Spr. syst.* 2. *p.* 635.—*Rheed. Mal.* 5. *t.* 18.——Mangatti in Malabar.

According to Rheede, who alone has seen the plant, the fruit is the same as in *G. sempervirens*. The above character is taken from his figure and imperfect description.

ORDER V.—MENISPERMACEÆ. *Juss.*

Sub-ord. 1. MENISPERMEÆ (*Arn.*) Flowers usually unisexual and very small. Sepals usually in a double row, 3–4 in each, deciduous: æstivation imbricative. Petals 1–6, hypogynous, scale-like, distinct or united into a cup-shaped corolla, rarely none: æstivation somewhat valvular. Stamens monadelphous or occasionally distinct, sometimes opposite to the petals and equal to them in number, sometimes 3–4 times as many: anthers adnate; cells placed end to end, dehiscing either vertically or horizontally, but always longitudinally and by a continuous fissure. Ovaria usually numerous, free or slightly united by their inner margin, unilocular. Drupes baccate, one-seeded, oblique. Embryo curved, radicle superior. Albumen thin, fleshy, rarely none.—Climbing shrubs, with alternate leaves, and very minute flowers.

I. COCCULUS. *Bauh.; DC.*

Flowers unisexual, (always?) dicecious. Calyx of 6 sepals in a double series, with two, three, or more close-pressed bracteoles. Corolla of 6 petals. MALE. Stamens 6, or rarely 3, opposite to the petals, distinct: anthers 2-celled, terminal, dehiscing vertically: filaments either filiform with the anther cells horizontal, approximate, and each externally 2-lobed; or thickened at the apex with the cells divaricating downwards and separated by the connectivum. FEM. Ovaries 3, 6, or numerous. Drupes 1–6, or numerous, 1-celled, 1-seeded.—Peduncles axillary or rarely lateral; males usually many flowered; females generally few-flowered, without bracteas, or with very small ones if present.

§ 1. *Seed globose, deeply excavated at the hilum; albumen fleshy; cavity for the embryo in the albumen broad and very shallow, resembling an internal slit.*

41. (1) C. *suberosus* (DC.:) twining: bark corky: leaves broadly ovate, truncated or somewhat cordate at the base, acute, firm; young ones more cordate, rounder, somewhat mucronulate, more tender, more or less pube-

Digitized by Google

scent: female flowers in lateral compound racemes: drupes 2–3, globose: cotyledons distant, linear-oblong, very membranaceous.—*DC. prod.* 1. *p.* 97; *Wall.! L. n.* 4954; *Wight! cat. n.* 46.—C. orbiculatus, *DC. prod.* 1. *p.* 98 (excl. syn. *Pluk.*)—C. lacunosus, *DC. prod.* 1. *p.* 97.—C. flavescens, *DC.? prod.* 1. *p.* 97.—Menispermum Cocculus, *Linn.; Gærtn. fr. t.* 70. *f.* 1.—M. orbiculatum, *Linn.; Spr. syst.* 2. *p.* 156.—M. lacunosum, *Lam.; Spr. syst.* 2. *p.* 156.—M. flavescens, *Lam.?; Spr.? syst.* 2. *p.* 256.—*Rheed. Mal.* 7. *t.* 1, *and* 11. *t.* 62; *Rumph. Amb.* 5. *t.* 22, *and t.* 24?——Malabar.

The shallow hollow that contains the embryo is nearly as broad as the whole albumen: the cotyledons, at first small, afterwards enlarge, although still very thin, diverge, and each occupies a side of the cavity. The back and front layers of albumen then become soldered in the middle (the mark of which may be observed on cutting the seed transversely) and present the appearance, figured by Gærtner, of the albumen being 2-celled with a cotyledon in each cell.

42. (2) C. *Malabaricus* (DC.:) twining: leaves cordate-ovate, acuminated, upper side puberulous, under densely pubescent: racemes of female flowers lateral?, as long as the leaves, simple: stamens 6: drupes 3.—*DC. prod.* 1. *p.* 97.—Menispermum Malabaricum, *Willd.; Spr. syst.* 2. *p.* 155; *Ham.! in Wall. L. n.* 4969.—*Rheed. Mal.* 7. *t.* 19, 20.

The only specimen we have seen is, from Sanashygota in Bengal, in Hamilton's herbarium belonging to the University of Edinburgh: it has the branches here and there furnished with curious scutelliform warts.

43. (3) C. *cordifolius* (DC.:) twining; bark corky, slightly tubercled: leaves roundish-cordate with a broad sinus, shortly and sharply pointed, glabrous: racemes axillary or lateral; of male flowers longer than the leaves, pedicels several together; of female scarcely so long as the leaves, pedicels solitary: petals unguiculate; unguis linear, slightly margined upwards; limb triangular-ovate, reflexed: stamens 6; filaments thickened at the apex; anther-cells divaricating: ovaries 3: drupes 2–3, globose: embryo small, cotyledons orbicular, approximate, fleshy.—*DC. prod.* 1. *p.* 97; *Wall.? L. n.* 4955; *Wight! cat. n.* 44.—C. convolvulaceus, *DC. prod.* 1. *p.* 97.—C. verrucosus, *Wall.! L. n.* 4966. *c–e.*—Menispermum cordifolium, *Willd.; Roxb.? in Lin. Soc. Tr.* 13. *p.* 62; *Spr. syst.* 2. *p.* 155.—M. glabrum, *Klein* (not *Koen.*) —*Rheed. Mal.* 7. *t.* 21.

C. convolvulaceus, DC. is an accidental state of the plant. Roxburgh, in his description, and figure at the India House (under *M. coccineum*, tab. 128), represents the petals cuneate-oblong, erect, and embracing the filaments; hence our doubts about his and Wallich's being the same with ours, which however is common about Madras and Samulcottah (where Roxburgh so long resided), and is undoubtedly that sent by Klein to Willdenow and Roxburgh.—*C. crispus* DC. (*Men. verrucosum* Roxb.) appears to differ by the more tubercled bark; more pointed leaves, and their narrow sinus; by the cuneate-oblong but also reflexed petals, and four-lobed anthers.

§ 2. *Seed terete, long, uncinate; embryo enclosed in a fleshy albumen, and of about the same length.*

44. (4) C. *acuminatus* (DC.:) twining: leaves ovate, acuminated, acute or truncate or slightly cordate at the base, glabrous: racemes axillary, usually about half the length of the leaf; pedicels in the males one or two from each bractea, 2–3-flowered; in the females solitary, 1-flowered: petals obcordate, much shorter than the filaments: stamens 6, as long as the inner row of the sepals; anther-cells divaricating: ovaries 9–12: drupes numerous, stalked, obovoid; nut compressed.—*DC. prod.* 1. *p.* 99; *De Less. ic. sel.* 1. *t.* 95; *Wight! cat. n.* 45.—C. radiatus, *DC. prod.* 1. *p.* 99.—C. polycarpus, *Wall.! L. n.* 4958.—Menispermum acuminatum, *Lam.; Spr. syst.* 2. *p.* 155. M. radiatum, *Lam.; Spr. syst.* 2. *p.* 157.—M. polycarpum, *Roxb.*—Tiliacora

Digitized by Google

racemosa, *Colebr. in Lin. Soc. Trans.* 13. *p.* 67.—Braunea menispermoides, *Willd. sp.* 4. *p.* 797 (as to the leaves and male flowers).—*Rheed. Mal.* 7. *t.* 3. ——Madras, rare; abundant on the sea-coast near Negapatam in Tanjore.

When the nut is cut transversely, it *appears* as if with two cells; but there is only one, as may be proved by a longitudinal section.

† 45. (5) C. *macrocarpus* (W. & A.:) racemes of fruit compound, lax; pedicels opposite: ovaries 3: drupes obovoid, curved, almost sessile; nut compressed.—*Wight! cat. n.* 41.——Malabar.

We have only seen the racemes of fruit; they are eight inches to a foot in length; the drupe is fully an inch long.

§ 3. *Seed terete, forming nearly a complete circular ring; embryo inclosed in a fleshy albumen, and of about the same length.*

46. (6) C. *villosus* (DC.:) twining: leaves on old branches cordate-orbicular or hastate-3-lobed, obtuse or retuse, mucronulate; on young shoots oblong, cordate or acute at the base, obtuse with a mucro or acute, more or less downy: racemes axillary, not half the length of the leaves, of male flowers branched and corymbose, of female simple and 1-3-flowered: petals cuneate-oblong, emarginate, about equal to the filiform filaments: stamens 6; anther-cells approximated: ovaries 3: nuts of the drupe reniform, compressed. —*DC. prod.* 1. *p.* 98; *Wall.! L. n.* 4957 (including *g*); *Wight! cat. n.* 42, 43. —C. sepium, *Colebr.*—C. Aristolochiæ, *DC.? prod.* 1. *p.* 97.—Menispermum villosum, *Lam.* (not *Roxb.*)—M. hirsutum, *Linn.*; *Roxb. in Lin. Soc. Trans.* 13. *p.* 58.—M. myosotoides, *Linn.*—*Pluk. t.* 384. *f.* 3, 5–7; *and t.* 13. *f.* 2?

Some specimens before us have the leaves quite glabrous, except on the nerves; in others, from the upper part of a shoot, they are densely villous on both sides. The figures in Plukenet do not represent separate varieties, but only different sexes, or different parts of the same individual. Roxburgh and Colebrooke say that the female peduncles are solitary; they are usually so, but we have seen occasionally as many as three, although only one appears to ripen its fruit. *C. cocculus*, Ham.! in Wall. L. n. 4957. *g*, is quite the same as to the female from Muniyari; the male, which comes from Phurinbari, is *Cissampelos convolvulacea.*

47. (7) C. *glaber* (Wight:) glabrous all over: stem twining; branches long, twiggy, pendulous; leaves ovate or oblong, mucronate, slightly cuneate at the base: cluster of male flowers small, axillary, sessile, globose, one-half shorter than the petiole, often by the falling of the upper leaves apparently arranged in an interrupted spike; peduncles of females usually solitary, 1-flowered, equal to the petiole: petals roundish-ovate, concave, close to the back of, and about the length of, the filaments: anther-cells approximate: ovaries 3: nuts reniform, compressed.—*Wall.! L. n.* 4975 (there called *C. lævis*, under which name, by mistake, the specimens were sent to Dr Wallich); *Wight! cat. n.* 47.——Alpine valleys in the Madura district.

Allied to *C. ovalifolius*, DC. We would have adopted the name of *lævis*, although originating in a mistake, but *glaber* is obviously that which is applicable.

§ 4. *Seed terete, thick, forming nearly a complete ring; albumen none!; embryo large; radicle minute; cotyledons fleshy, semicylindrical, tapering towards the radicle.*

48. (8) C. *Plukenetii* (DC.:) stem twining, glabrous; young branches pubescent: leaves ovate, mucronate, sometimes slightly cordate at the base, rarely retuse at the apex, glabrous; when young the nerves on the under side, and long petioles hairy: racemes spike-like, longer than the leaves; pedicels short, with a subulate bractea at their base, of males 2-3 together,

Digitized by Google

of females usually solitary: petals cuneate-oblong, emarginate, obtusely 2-toothed near the base; in the male about equal to the stamens, somewhat membranaceous above, below fleshy, and embracing the filaments; in the female fleshy, and internally warted: anther-cells approximated: ovaries 3: drupes solitary; nut reniform.—*DC. prod.* 1. *p.* 97; *Wight! cat. n.* 48, 49. —C. Wightianus, *Wall.! L. n.* 4959.—Cissampelos ovata, *Poir.; DC. prod.* 1. *p.* 100; *Spr. syst.* 3. *p.* 911.—*Pluk. Mant. p.* 52. *pl.* 2. *t.* 345, *f.* 7.——In sandy-soil by the sea-coast in Tanjore, frequent.

II. CLYPEA. *Blume.*

Dicœcious. Calyx of 6 sepals in a double series, with 3–6 close pressed bracteoles. Corolla none. MALE. Stamens united into a central column, dilated at the apex, bearing several 2-celled anthers; cells opening horizontally, placed end to end, and forming a ring round the top of the column. FEM. Ovary solitary. Stigmata 3, (or rarely 6?) Drupe obliquely reniform; nut compressed, wrinkled round the margin. Seed solitary, uncinate. Albumen fleshy. Embryo terete, of the same shape, and about as long as the seed.—Twining shrubs. Leaves peltate. Panicles axillary, both male and female without cordate bracteas.

49. (1) C. *hernandifolia* (W. & A.:) leaves ovate, rounded or scarcely truncate at the base, mucronulate, upper side glabrous, under slightly hairy: panicles about equal to the petioles, umbelliform; rays umbelliferous; pedicels very short: polliniferous ring 6-celled.—*Wight! cat. n.* 953.—Cissampelos hernandifolia, *Willd. sp.* 4. *p.* 861; *DC. prod.* 1. *p.* 100; *Spr. syst.* 3. *p.* 910; *Wall.! L. n.* 4977. *e.*—C. hexandra, *Roxb. in E. I. C. mus. tab.* 1001.—C. glabra, *Ham.!*—Cocculus Roxburghianus, *Wall.! L. n.* 4972. *a.* (not *DC.*) ——Colemala.

50. (2) C. *Burmanni* (W. & A.:) leaves triangular, acuminated, mucronate, slightly cordate at the base; upper side shining and sprinkled with a few hairs, under more or less densely pubescent: panicles narrow, elongated, much longer than the leaves; branches alternate.—*Wight! cat. n.* 40.—Cocculus Burmanni, *DC. prod.* 1. *p.* 96.—C. peltatus, *DC. prod.* 1. *p.* 96.—Cissampelos discolor, *Wall. L. n.* 4982 (not *DC.*)—Menispermum peltatum, *Lam.*; *Spr. syst.* 2. *p.* 156.—Wal-Tiedde, *Gærtn. fr.* 2. *t.* 180.—*Rheed. Mal.* 7. *t.* 49; *Pluk. t.* 24. *f.* 6; *Burm. Zeyl. t.* 101.——Malabar and Coromandel.

III. CISSAMPELOS. *Linn.; Lam. ill. t.* 830.

Dicœcious. MALE. Sepals 4 in a double series. Petals 4 united into a cup-shaped corolla, with usually an entire margin. Stamens united into a slender column dilated at the apex, bearing two 2-celled anthers opening horizontally; cells placed end to end and forming a 4-lobed 4-celled annulus round the top of the column. FEM. Calyx of one! lateral sepal. Corolla of one! petal in front of the sepal. Ovary solitary. Stigmata 3. Drupe obliquely reniform; nut compressed, wrinkled round its margin. Seed solitary, uncinate. Embryo long, terete, inclosed in a fleshy albumen.—Twining shrubs. Leaves peltate or cordate, mucronulate at the apex. Racemes axillary; of the males usually trichotomously branched and somewhat corymbose, with subulate, small bracteas, or with none at all; of the females simple, elongated, bearing broad alternate foliaceous bracteas with several 1-flowered pedicels in their axil.

51. (1) C. *convolvulacea* (Willd.:) stem pubescent: leaves cordate, usually obtuse or acute, sometimes acuminated, rarely emarginate, sinus narrow or

Digitized by Google

wide; upper side glabrous or slightly pubescent, under more or less pubescent or sometimes tomentose; petioles inserted at the margin, or sometimes slightly intramarginal: male racemes 3–4, shorter than the petiole; sepals orbicular, unguiculate; column of stamens longer than the entire and externally hairy cup-shaped corolla: female racemes usually in pairs, sometimes solitary and forked, in flower scarcely so long as the petiole, in fruit often much longer than the leaf; drupes hairy.—*Wight! cat. n.* 39—α; leaves more or less pubescent; petioles marginal or nearly so.—C. convolvulacea, *Willd. sp. pl.* 4. *p.* 863.—*DC. prod.* 1. *p.* 101; *Spr. syst.* 3. *p.* 911; *Wall.! L. n.* 4979.—β; leaves almost quite glabrous, decidedly peltate, ovate-orbicular, truncate at the base.—C. hernandifolia, *Wall.! L. n.* 4977. *a, b, d,* and perhaps most of the others, (not of *Willd.*)—C. glabra, *Roxb. hort. Bengh. p.* 74.—C. Pata, *Roxb. in E. I. C. mus. tab.* 187.—C. convolvulacea, *Roxb. hort. Bengh. p.* 74 (as to the provincial name *Pata*, but not the plant of Buch. Hamilton in the Calcutta garden.)—Braunea menispermoides, *Willd.?* (as to the female.)—γ; leaves reniform rounded, villous, not peltate: male flowers on slender small-leaved floral branches.—C. orbiculata, *DC. Prod.* 1. *p.* 101; *Spr. syst.* 3. *p.* 911.——C. cocculus *male, Ham.! in Wall. L. n.* 4857. *g.* (under *Cocculus villosus.*)—δ; leaves ovate-orbicular, truncate at the base, softly villous, peltate; male racemes from the axils of the older leaves.—C. hirsuta, *DC. prod.* 1. *p.* 101; *Spr. syst.* 3. *p.* 910.—C. mauritiana, *Ham.! in Wall. L.* 4980. *a,* (not *b–f.*)—— Widely distributed throughout the Peninsula.

Specimens from the same stem vary exceedingly. *C. Pareira* chiefly differs by the obovate sepals without an unguis, and the staminal column so short as to be nearly concealed within the cup-shaped corolla. According to Hamilton's herbarium, it is the male plant in Wall. L. n. 4857. *g.* which comes from Phurinbari; the female, from Muniyari, is *Cocculus villosus. C. mauritiana,* Wall. L. n. 4980. *b!, d!, f!,* and perhaps *c, e,* (but not *a*) is *Cocculus incanus,* Colebr. in Linn. Soc. Trans. 13. p. 57. Perhaps *C. mauritiana,* Pet. Th. and DC. is not distinct from δ, but we have not seen it.

ORDER VI.—BERBERIDEÆ. *Ventn.*

Sepals 3-4-6, deciduous, in a double row, accompanied externally with petaloid scales. Petals hypogynous, equal to the sepals in number and opposite to them, or twice as many; often furnished in the inside with an appendage at the base. Stamens hypogynous, equal in number to the petals and opposite to them: anthers bilocular, the cells opening elastically with a valve from the bottom to the top. Ovarium solitary, unilocular, containing 2-12 ovules, which are erect, or attached laterally to the inner margin, and forming there one or two rows: style sometimes lateral, short: stigma orbicular. Fruit baccate or capsular, indehiscent. Albumen fleshy or horny. Embryo straight, in the axis of the albumen: radicle pointing to the hilum: cotyledons flat.—Leaves alternate, without stipules.

I. BERBERIS. *Linn.; Lam. ill. t.* 253; *Gært. fr. t.* 41.

Sepals 6, with three external close pressed bracteas. Petals 6, usually with two distinct glands at the base. Stamens 6. Stigma orbicular, depressed, sessile or very rarely with an evident style. Fruit a berry with 1–9 seeds.—Shrubs. Primary leaves abortive and usually changed into thorns; secondary leaves fascicled in the axils of the others. Flowers yellow.

Digitized by Google

52. (1) B. *tinctoria* (Lesch.:) spines deeply divided into three sharp rigid segments: leaves simple, oboval, quite entire, or with distant small spiny teeth, glaucous with the principal nerves and veins prominent beneath, but not above: racemes stalked, longer than the leaves; pedicels slender: petals distinctly biglandular: filaments without teeth.—*Lesch. mem. mus.* 9. *p.* 306; *DeLess. ic.* 2. *p.* 1. *t.* 2; *Wall.! L. n.* 1476; *Wight! cat. n.* 51.——Neelgherries.

53. (2) B. *Leschenaultii* (Wall.:) leaves pinnate; leaflets about six pair, ovate, nearly equal in size, slightly cordate at the base, repand with 6–8 thorny teeth at each side, about 5-nerved at the base; lower pair of leaflets close to the stem: racemes elongated, slender; bracteoles at the base of the pedicel oblong, obtuse: petals with two distinct glands; filaments without teeth: berry globose, crowned with the evident style and stigma.—*Wall.! L. n.* 1479; *Wight! cat. n.* 50.—Mahonia Nepaulensis, var., *DC. regn. veg.* 2. *p.* 713.——Neelgherries, at an elevation of about 8000 feet.

Perhaps not distinct from *B. Nepaulensis*, but that species has more lanceolate leaflets which are longest towards the top of the leaf, and the fruit is described and figured as oblong with a sessile stigma.

ORDER VII.—NYMPHÆACEÆ. *Sal.*

Sepals 4–5. Petals and stamens numerous in several rows: filaments petaloid: anthers adnate, introrse, opening by two longitudinal clefts. Torus large, fleshy, elevated, bearing in its substance, or enclosing, numerous ovaries and carpels. Carpels 1–2- or many-seeded. Albumen of two kinds: a *perisperm* which is either present or absent; and an *endosperm*, immediately surrounding the embryo.—Aquatic herbs, with peltate or cordate leaves.

I. NELUMBIUM. *Juss.; Lam. ill. t.* 453.

Torus containing in its substance the numerous separate ovaries, which have each a simple style and stigma. Nuts inserted, but loose, in the hollows of the torus, 1–2-seeded. Perisperm none. Endosperm conspicuous. Embryo large, with two fleshy cotyledons.—Leaves orbicular, attached by their centre.

54. (1) N. *speciosum* (Willd.:) corolla polypetalous: connectivum produced beyond the cells of the anthers into a clavate appendage.—*DC. prod.* 1. *p.* 113; *Spr. syst.* 2. *p.* 634; *Lam. ill. t.* 453; *Roxb. fl. Ind.* 2. *p.* 647; *Wall.! L. n.* 7259; *Wight! cat. n.* 52.—Nelumbo nucifera, *Gærtn. fr.* 1. *t.* 19. *f.* 2.—Nymphæa Nelumbo, *Linn.*—*Pluk. t.* 207. *f.* 5.——In tanks in Tanjore, frequent.

II. NYMPHÆA. *Linn.; Lam. ill. t.* 453; *Gærtn. fr. t.* 19.

Calyx usually of 4 sepals girding the base of the torus. Petals numerous (16–28), attached to the torus. Stamens numerous, inserted with the petals, but higher up. Torus bottle-shaped, indehiscent, surrounding ovaries, styles, and stigmas. Ovaries attached to the inside of the torus, on the top of which are the adnate radiate stigmas. Carpels 16–20, membranaceous. Seeds very numerous in each carpel, attached to spongy placentæ that form false dissepiments to the fruit. Endosperm fleshy, and with the enclosed embryo, seated on the inside, at the base, of the farinaceous perisperm: cotyledons foliaceous.—Leaves cordate, peltate or with the petiole attached to the edge.

Digitized by Google

55. (1) N. *stellata* (Willd.:) leaves quite entire but with the margin waved, glabrous on both sides, without dots; lobes at the base diverging; petiole attached a little within the margin: anthers with the connectivum prolonged into an appendage: stigma 8–12-rayed.—*DC. prod.* 1. *p.* 115; *Spr. syst.* 2. *p.* 604; *Roxb. fl. Ind.* 2. *p.* 579; *Wall.! L. n.* 7253; *Wight! cat. n.* 55.—N. cyanea, *Roxb. fl. Ind.* 2. *p.* 577.—N. Nouchali, *Burm.*—*Rheed. Mal.* 11. *t.* 27.——Frequent in tanks in Tanjore.

56. (2) N. *rubra* (*Roxb.*:) leaves sharply toothed, downy but not spotted beneath; lobes diverging; petiole intramarginal: flowers red: connectivum not prolonged: stigma 10–20-rayed.—*Roxb. fl. Ind.* 2. *p.* 576; *DC. Prod.* 1. *p.* 115; *Spr. syst.* 2. *p.* 605; *Wall.! L. n.* 7255; *Wight! cat. n.* 53; *Sim's Bot. Mag. t.* 1280 *and* 1364.——Tanks and ditches in Tanjore.

57. (3) N. *pubescens* (*Willd.*:) leaves sharply toothed, reniform-orbicular; under side densely and softly pubescent, spotted; lobes divaricated; petiole intramarginal: flowers white: connectivum not prolonged: stigma with about 20 rays.—*DC. prod.* 1. *p.* 115; *Spr. syst.* 2. *p.* 605; *Wall.! L. n.* 7256; *Wight! cat. n.* 54.—N. Lotus, *Burm.*; *Roxb. fl. Ind.* 2. *p.* 577.—*Rheed. Mal.* 11. *t.* 26.

ORDER VIII.—PAPAVERACEÆ. *Juss.*

Sepals two, deciduous. Petals hypogynous, four cruciate (or a multiple of four), regular; rarely wanting. Stamens eight, or some multiple of four, usually indefinite, inserted in four parcels one of which adheres to the base of each petal: anthers bilocular, erect. Ovary solitary: style short or none: stigmas alternate with the placentæ, two or many, in which case they are stellate on the flat apex of the ovarium. Fruit one-celled, either siliquæform with two, or capsular with several, parietal placentæ. Seeds numerous. Albumen between fleshy and oily, at the base of which is a minute straight embryo, with plano-convex cotyledons.—Plants herbaceous or shrubby, with a milky juice. Leaves alternate, divided. Peduncles long, one-flowered.

I. PAPAVER. *Linn.*; *Gært. fr. t.* 60; *Lam. ill. t.* 451.

Sepals 2, convex, deciduous. Petals 4. Stamens numerous. Style none. Stigmata 4–20, radiating, sessile on the disk that crowns the ovary. Capsule obovate, 1-celled, consisting of 4–20 carpels included in a membranaceous expansion of the torus, opening by short valves under the crown formed by the stigmas. Placentæ between the valves, produced internally into spurious incomplete dissepiments.—Herbaceous plants with a white juice. Peduncles drooping at the extremity before flowering.

* 58. (1) P. *somniferum* (Linn.:) stem smooth glaucous: leaves amplexicaul, repand, cut and toothed; teeth somewhat obtuse: capsules obovate or globose, and the calyx glabrous.—*DC. prod.* 1. *p.* 120; *Spr. syst.* 2. *p.* 570; *Lam. ill. t.* 451; *Roxb. fl. Ind.* 2. *p.* 571; *Wight! cat. n.* 57.

II. ARGEMONE. *Linn.*; *Gært. fr. t.* 60; *Lam. ill. t.* 452.

Petals 4–6. Stamina numerous. Style scarcely any: stigmas 4–7, radiating, concave, free. Capsule obovate, 1-celled, opening by valves at the apex; placentæ linear. Seeds sphærical, pitted.—Annual glaucous herbs, abounding in a yellow juice, and covered with rigid prickles. Leaves sessile

Digitized by Google

repand-sinuated, with thorny teeth. Peduncles erect both before and after flowering. Flowers yellow or white.

59. (1) A. *Mexicana* (Linn.:) leaves deeply repand-sinuate, blotched with white: flowers solitary: calyx glabrous, prickly: petals 4–6: stigmas 4–5: capsules prickly, 4–5-valved.—*DC. prod.* 1. *p.* 120; *Spr. syst.* 2. *p.* 604; *Wight! cat. n.* 59.

ORDER IX.—FUMARIACEÆ. *DC.*

Sepals 2, deciduous. Petals hypogynous, 4, cruciate; one or both of the two outer saccate at the base; the two inner callous at the apex, where they cohere and inclose the anthers and stigma. Stamens hypogynous, 6, diadelphous, opposite the outer petals: anthers of the middle stamens of each parcel 2-celled, of the outer ones 1-celled. Ovary 1-celled: style filiform, stigma with 2 or more points. Fruit a 1-seeded utricle; or a 2-valved, 2-seeded, indehiscent capsule; or a 2-valved, polyspermous siliqua. Seeds with an arillus, attached to narrow parietal placentæ. Albumen fleshy. Embryo nearly straight, minute, eccentric.—Herbaceous plants, with a watery juice. Leaves alternate, multifid.

I. FUMARIA. *Linn.; Gærtn. fr. t.* 115.

Petals 4; the lower one distinct, linear; the three upper united, the middle one spurred downwards. Stamens diadelphous. Fruit ovate or globose, indehiscent, 1-seeded. Style deciduous after flowering.—Annual smooth, branched herbs. Leaves many times divided. Flowers racemose, whitish or purplish. Peduncles terminal or opposite to the leaves.

60. (1) F. *parviflora* (Lam.:) leaves linear, channelled: bracteas at first as long as the flower, afterwards about as short as the fructiferous pedicel: sepals minute: fruit globose, slightly pointed.—*DC. prod.* 1. *p.* 130; *Spr. syst.* 3. *p.* 159; *Wall.! L. n.* 1436; *Wight! cat. n.* 61.——Neelgherries.

In the Indian plant the flowers are rose-coloured, and approach closely to *F. Vaillantii*.

*61. (2) F. *officinalis* (Linn.:) bracteas two or three times shorter than the fruit-bearing pedicel: sepals ovate-lanceolate, acute, sharply toothed, scarcely so long as the globose very abrupt or obcordate fruit.—*DC.! prod.* 1. *p.* 130; *Spr. syst.* 3. *p.* 159; *Wall. L. n.* 1437.

ORDER X.—CRUCIFERÆ. *Juss.*

Sepals 4; two, corresponding to the two stigmas, are anterior and posterior, and narrower than the others; two are lateral, or corresponding to the valves, broader, concave at the base, gibbous or spurred. Corolla hypogynous, cruciform: petals 4, alternate with the sepals, nearly equal, deciduous. Stamens hypogynous, 6; the two opposite the lateral sepals are solitary, shorter, and occasionally toothed; four in pairs opposite the anterior and posterior sepals, longer, generally free, sometimes connate, or furnished with a tooth on the inside: anthers bilocular, introrse. Torus with several glands between the petals

Digitized by Google

and the stamens, and ovarium. Ovarium syncarpous, usually bilocular. Placentæ parietal, usually meeting in the middle, and forming a spurious dissepiment. Stigmas 2, opposite the placentæ, or anterior and posterior. Fruit a siliqua or silicule, rarely 1-celled and indehiscent, usually spuriously bilocular, and dehiscing by two valves separating from the placentæ; 1- or many-seeded. Seeds campulitropous, pendulous, attached in a single row by a funiculus to each side of the placentæ. Albumen none. Embryo with the radicle folded up on the cotyledons, which are next the placenta.—Herbaceous plants, or very seldom suffruticose. Leaves alternate.

The few following are all the species of this order we can introduce. Some others are inserted in Wallich's List as coming either from the Peninsula, or found in Heynes' or the Madras herbaria: of these *Lepidium sativum* Linn., *Brassica oleracea* Linn., *Raphanus sativus* Linn., and *Eruca sativa* Linn., are commonly cultivated, but not indigenous; *Sinapis glauca* Roxb.? (Wall. L. n. 4796), and *S. brassicata* Linn. are from the missionaries' garden; *S. dichotoma* Roxb. we have seen in Hamilton's herbarium, but as Wallich does not seem to be certain that the Neelgherry plant (Wall. L. n. 4791. *b*, *c*.) is the same, we do not give a description of it. *Cheiranthus maritimus* Wall. L. n. 4801. *b*, is a European plant, cultivated at Bangalore, and different from *C. Farsetia* Ham. Of *Sinapis rugosa* and *Sinapis lævigata* of Wallich's List, we know nothing; the last was obtained, so named, from the Madras herbarium, and consequently is probably the same with *S. juncea* Wall. L. n. 4774. *a*.

I. NASTURTIUM. *Brown.*

Calyx patent, equal at the base. Petals obovate, entire, or abortive. Stamens distinct, not toothed. Stigma somewhat capitate or 2-lobed. Siliqua sessile, bilocular, longitudinally dehiscent, nearly terete, sometimes shortened so as to resemble a silicule, usually curved upwards; valves externally convex, neither nerved nor keeled: septum entire, broader than the seeds. Seeds several, small, irregularly in a double series, obovate-oblong, without a border. Radicle applied to the edge of the cotyledons (o=).—Herbaceous plants usually aquatics. Leaves often pinnated. Pedicels filiform. Flowers yellow or white.

62. (1) N. *Madagascariense* (DC.:) annual, branched: root fusiform and fibrous: leaves lyrate-pinnatifid, unequally toothed: pedicels short, very patent: petals (yellow) scarcely longer than the calyx: glands of the torus minute: siliqua terete, 2–5 times longer than the pedicel, tipped with the style, which is about a half shorter than the pedicel, and the 2-lobed stigma. —*α*; Leaves glabrous; stem firm.—*Wight! cat. n.* 67.—N. montanum, *Wall.! L. n.* 4778.—*β*; leaves glabrous: stem more flaccid.—*Wight! cat. n.* 66.—N. Madagascariense, *DC. prod.* 1. *p.* 138; *Spr. syst.* 2. *p.* 882.—N. Gangeticum, *Ham.! in Wall. L. n.* 4777.—*γ*; leaves and stems pubescent.—N. micranthum, *DC. prod.* 1. *p.* 138; *Spr.* 2. *p.* 882.—N. divaricatum, *Ham.! in Wall. L. n.* 4776.—Sisymbrium micranthum, *Roth. nov. sp. p.* 323.—— *α* and *β* from the Neelgherries; *γ* in Heyne's Herbarium, probably from Mysore.

N. diversifolium, Wall. L. n. 4775, judging from Don's character of his *N. heterophyllum*, which is probably identical, seems referable to either *α* or *β*.

II. CARDAMINE. *Linn.; Lam. ill. t.* 562; *Gærtn. fr. t.* 143.

Calyx connivent or somewhat patent, equal at the base. Petals with a claw; limb entire. Stamens distinct, without teeth. Siliqua sessile, linear,

Digitized by Google

elongated, compressed; valves flat, nerveless, somewhat smaller than the incrassated replum,* from which they usually separate elastically. Style short, or none: stigma nearly simple. Seeds ovate, without a border, forming a single series: podosperms slender. Radicle applied to the edge of the cotyledons (o=).—Leaves petiole, dentire, lobed, or variously divided, often different on the same individual. Flowers white or rose-coloured.

63. (1) C. *Borbonica* (Pers.:) leaves trifoliolate; leaflets hairy on both sides, particularly on the nerves beneath, petioled, ovate acuminated, unequal at the base, irregularly and sharply toothed, terminal one sometimes 3-lobed or divided into 3 leaflets similar to the others: siliqua erect.—*DC. prod.* 1. *p.* 150; *Spr. syst.* 2. *p.* 885; *Wight! cat. n.* 69.—C. Wightiana, *Wall.*! *L. n.* 4780.—Neelgherries, in moist marshy ground about Ootacamund, at an elevation of about 8000 feet.

64. (2) C. *hirsuta* (Linn.:) leaves all pinnated: leaflets of radical leaves petiolate, roundish; upper stem leaves oblong, nearly sessile; lower pair of both distant from the stem: stamens 4–6, equal in length to the oblong petals: petals sometimes not so long, sometimes longer than the calyx: stigma nearly sessile.—*DC.! prod.* 1. *p.* 152; *Spr. syst.* 2. *p.* 887; *Wall.! L. n.* 4781; *Wight! cat. n.* 70, 71, 72.——Neelgherries.

Found all over the world, and varying a good deal according to soil, moisture, and exposure. *C. Pensylvanica, Virginica, teres, sylvatica, umbrosa,* and perhaps *parviflora* of De Candolle and other authors, are referable to this species.

III. SINAPIS. *Linn.; Gærtn. fr. t.* 143.

Calyx equal at the base, patent. Limb of the petals obovate. Stamens distinct, entire. Siliqua somewhat terete, 2-celled, 2-valved, (sometimes of two joints, of which the upper is without valves, resembling a beaked style). Seeds in a single series in each cell, globose. Cotyledons folded, containing the radicle in the fold (conduplicate o>>).—Herbaceous, rarely suffrutescent plants, with yellow flowers.

65. (1) S. *juncea* (Linn.:) glabrous, lower leaves ovate-lanceolate, deeply serrated; upper ones lanceolate, attenuated at the base, quite entire: branches fascicled: siliqua somewhat erect; upper joint valveless, awl-shaped, destitute of seeds.—*DC.! prod.* 1. *p.* 218; *Spr. syst.* 2. *p.* 912; *Wall.! L. n.* 4794; *Wight! cat. n.* 68.——Neelgherries, and Dindygul mountains; perhaps not truly indigenous.

IV. CAPSELLA. *Ventn.; Lam. ill. t.* 557. *f.* 2; *Schk. Handb.* 2. *t.* 180.

Calyx equal at the base. Petals entire. Stamens not toothed. Silicule compressed, triangular, truncate at the apex: septum membranaceous, nearly linear; valves compressed, keeled (or navicular) but not winged at the back. Seeds many in each cell, without a border. Cotyledons linear, with the radicle at their back (o||).—Annual. Radical leaves rosulate, toothed, cut or variously lobed; stem leaves few, erect, oblong, sagittate at the base. Racemes terminal, elongated: pedicels filiform, much longer than the pods. Flowers small white.

66. (1) C. *Bursa-pastoris* (Mœnch.)—*DC.! prod.* 1. *p.* 177; *Wall.! L. n.* 4787; *Wight! cat. n.* 65.—Thlaspi Bursa-pastoris, *Linn.*—T. Bursa, *Spr. syst.* 2. *p.* 879.——Mountainous districts.

* *Replum* is the frame surrounding the dissepiment, from which the valves fall off, and to which the placentæ are attached.

Digitized by Google

ORDER XI.—CAPPARIDEÆ. *Juss.*

Sepals 4. Petals 4, cruciate, usually unguiculate and unequal, hypogynous, sometimes wanting. Stamens hypogynous, 4, 6, or indefinite, but in general some high multiple of 4. Torus hemispherical or elongated, often bearing glands. Ovary stalked: style 1, filiform, or sometimes none. Fruit unilocular, siliquæform, or fleshy and indehiscent, rarely 1-seeded, usually with two polyspermous placentæ at the margin of the valves or carpels. Seeds generally reniform, with a thickened testa. Albumen none. Embryo incurved: cotyledons foliaceous, somewhat flat.—Leaves alternate, stalked, undivided, or palmate. Stipules none, or spinescent.

TRIBE I.—CLEOMEÆ. *DC.*

Fruit truly capsular; valves somewhat membranaceous, dehiscent.—Herbaceous or very rarely suffrutescent plants.

I. GYNANDROPSIS. *DC.*

Calyx of four spreading sepals. Petals 4. Torus linear, elongated. Stamens 6: the lower part of the filaments united with the torus its whole length; upper part free. Siliqua stalked within the calyx from the top of the torus.

The filaments being adnate to the torus, present the same appearance as if six free stamens originated from the top of the elongated torus at a distance from the calyx. The African and Indian species have an open æstivation, the petals being open in the bud, and never at any period covering the stamens.

67. (1) G. *pentaphylla* (DC.:) stem more or less covered with glandular pubescence or hairs: middle leaves 5-foliolate, lower and floral leaves trifoliolate: leaflets obovate, puberulous, quite entire or slightly serrulated.—*DC.! prod.* 1. *p.* 238; *Wall.! L. n.* 6964; *Wight! cat. n.* 73.—G. affinis, *Blume.*—Cleome pentaphylla, *Linn.*; *Spr. syst.* 2. *p.* 121.—*Rumph. Amb.* 5. *t.* 96. *f.* 3.——Common.

Cultivated specimens, from which De Candolle formed his specific character, are almost glabrous; but the stems of those from India are covered with short glandular hairs, often intermixed with longer ones; whence *G. heterotricha DC.* appears in no respect to differ as a species.

II. CLEOME. *Linn.*; *Gærtn. fr.* 1. *t.* 76.

Calyx of four spreading sepals. Petals 4. Torus short, nearly hemispherical. Stamens 6, or rarely only 4. Siliqua stalked within the calyx, or almost sessile.

The Indian species have the torus very minute, and the *thecaphore*, or stalk to the fruit, is usually short or entirely wanting, but is sometimes slightly elongated.

68. (1) C. *monophylla* (Linn.:) herbaceous, pubescent; leaves simple, petioled, lanceolate, obtuse or slightly cordate at the base: peduncles solitary: siliqua puberulous, terete, striated, acute at the base, but almost quite sessile, acuminated with the subulate style: torus inconspicuous.—*DC. prod.* 1. *p.* 239; *Spr. syst.* 2. *p.* 123; *Wall.! L. n.* 6965; *Wight! cat. n.* 74.—C. cordata, *Burch*; *DC. prod.* 1. *p.* 239.—*Rheed. Mal.* 9. *t.* 34; *Burm. Zeyl. t.* 100. *f.* 2.

69. (2) C. *tenella* (Linn.:) herbaceous, glabrous: leaves trifoliolate; leaflets linear, twice the length of the petiole: flowers hexandrous; siliqua sessile,

Digitized by Google

slender.—*DC. prod.* 1. *p.* 240; *Spr. syst.* 2. *p.* 123; *Wall. L. n.* 6966.—*Pluk. t.* 224. *f.* 3.——Courtallum; *Heyne.*

70. (3) C. *aspera* (Koen.:) herbaceous, glabrous, rough with minute scattered prickles on both the stem and leaves: leaves trifoliolate; leaflets oblong, many times longer than the petiole: stamens 6: siliqua terete, torulose, glabrous, attenuated at the base but quite sessile, acuminated with the subulate style: torus inconspicuous.—α; leaflets obtuse or slightly acute.—*Wight! cat. n.* 76.—C. aspera, *DC. prod.* 1. *p.* 241; *Spr. syst.* 2. *p.* 124; *Wall.! L. n.* 6967.—β; leaflets emarginate.—*Wight! cat. n.* 954.——In cultivated soil not very common.

71. (4) C. *Burmanni* (W. & A.:) herbaceous, glabrous: stem, but not the leaves, rough with minute scattered prickles: leaves trifoliolate; leaflets obovate, much longer than the petiole: stamens 6: siliqua terete, glabrous, attenuated at the base, about 4 or 5 times longer than the filiform thecaphore, acuminated with the subulate style: torus inconspicuous.—*Wight! cat. n.* 75.—C. dodecandra, *Herb. Banks!* (partly).—Polanisia dodecandra, *DC. prod.* 1. *p.* 242 (character bad).—*Burm. Zeyl. t.* 100. *f.* 1.——Rather frequent in loose dry cultivated soil.

III. POLANISIA. *Rafin.*

Calyx of four spreading sepals. Petals 4. Stamens 8–32; filaments filiform or dilated below the anthers. Torus minute. Siliqua sessile within the calyx, or with a very short thecaphore.

The following have the style shorter than the ovarium. *Physostemon* Mart., and *Corynandra* Schrad., ought scarcely to be separated.

72. (1) P. *Chelidonii* (DC.:) stem hispid with scattered short prickly hairs, otherwise glabrous: leaves 7–9-foliolate; leaflets obovate or oblong, cuneate, hispid with a close pressed rigid pubescence, scarcely so long as the petiole; upper floral leaves minute: stamens numerous (24–32); filaments club-shaped: siliqua glabrous, terete, sessile.—*DC. prod.* 1. *p.* 242; *Wall.! L. n.* 6969; *Wight! cat. n.* 78.—P. Schraderi, *DC. pl. rar. hort. Gen. fasc.* 3. *p.* 57.—P. Leschenaultii, *DC. l. c.*—Cleome chelidonii, *Linn.: Spr. syst.* 2. *p.* 125.—Corynandra pulchella, *Schrad.; Spr. syst. app. p.* 204.——Moist soil by the edges of rice fields.

Flowers rose-coloured.

73. (2) P. *icosandra* (W. & A.:) stem covered with viscid glandular hairs: leaves 3–5-foliolate; leaflets obovate-cuneate or oblong, pubescent, scarcely longer than the petiole: stamens about 20: siliqua terete, striated, rough with glandular hairs, sessile, acuminated.—*Wight! cat. n.* 77.—P. viscosa, β. *DC. prod.* 1. *p.* 242.—P. viscosa, *Wall.! L. n.* 6968.—Cleome icosandra, *Linn.*—C. dodecandra, *Linn.* (partly, and excluding the synonym).—C. viscosa, *Linn.* (excluding the synon., and most of the description).—*Rumph. Amb.* 5. *t.* 96. *f.* 2. (bad); *Burm. Zeyl. t.* 99.——Among rubbish and by the sides of walls.

Linnæus appears to have formed his *C. dodecandra* from a trifoliolate specimen of this plant: his *C. viscosa*, as far as regards the synonym, and the shape of the leaves, is the same with *P. felina*, DC. *P. viscosa*, DC., as to the character and cultivated specimens to which he refers, is *P. graveolens*, Raf.; his var. α is *P. felina*; and his β is the present plant. Sprengel's *C. viscosa* (Syst. 2. p. 125), refers more particularly to *P. graveolens*.

74. (3) P. *felina* (DC.:) thickly covered, especially the leaves, with short harsh prickly hairs: leaves trifoliolate; leaflets broadly obovate, cuneate, shorter than the petiole: stamens numerous (28–32): siliqua oblong-linear, compressed glabrous, sessile, suddenly attenuated into the style, about the length of the peduncle.—*DC. prod.* 1. *p.* 242; *Wall.! L. n.* 6971; *Wight!*

Digitized by Google

cat. n. 79.—C. felina, *Linn.*—C. dodecandra, *Linn.* (partly).—*Rheed. Mal.* 9. *t.* 23.——Courtallum, Malajabad, and elsewhere; but more rare than the other species.

†75. (4) P. *heterophylla* (Wall. L. n. 6970).

TRIBE II.—CAPPAREÆ. *DC.*

Fruit more or less fleshy, not dehiscent or imperfectly so.——Trees or shrubs.

IV. CRATÆVA. *Linn.; Lam. ill. t.* 395.

Calyx of 4 sepals. Petals 4, unguiculate, larger than the calyx; not closing over the stamens during æstivation (æstivation open. Br.) Stamens 8–28. Torus elongated or hemispherical. Berry stalked, between ovate and globose, pulpy within: pericarp thin.—Shrubs without thorns. Leaves trifoliolate. Limb of the petals (in the Indian species) broad and roundish.

76. (1) C. *Roxburghii* (Br.:) leaflets ovate, tapering at the base, suddenly acuminated; lateral ones unequal at the base: limb of the petals roundish-ovate: stamens numerous (16–20 or more): torus hemispherical: berry globose.—*Brown in Denh. and Clapp. trav. app.; Wight! cat. n.* 83, 84.—C. odora, *Ham.! in Linn. Soc. Trans.* 15. *p.* 118.—C. religiosa, *Ham.! l. c.* (not *Vahl*); *Wall. L. n.* 6972.—C. Tapia, *Vahl symb.* 3. *p.* 61.—Caparis trifolia, *Roxb.! fl. Ind.* 2. *p.* 571.——Coromandel coast, not uncommon.

In *C. religiosa*, Ham. (Wight! cat. n. 84), the leaflets are narrower than in his *C. odora* (Wight! cat. n. 83.)

77. (2) C. *Nurvala* (Ham.:) leaflets ovate-lanceolate, acuminated; lateral ones unequal at the base: limb of the petals ovate-roundish: stamens numerous: torus hemispherical: berry ovoid.—*Ham. in Linn. Soc. Trans.* 15. *p.* 121; *Wall.! L. n.* 6973; *Wight! cat. n.* 82.—C. Tapia, *Burm.* (partly).—C. inermis, *Linn.* (partly).—*Rheed. Mal.* 3. *t.* 42.——Frequent in rich moist soil on the banks of ditches and rivers on the Malabar coast; also in Mysore, where it grows to the height of 15 or 20 feet.

V. NIEBUHRIA. *DC.*

Calyx of 4 sepals, united at the base into a tube, surrounding, but free from, the lower part of the torus: æstivation valvular. Petals none, or 4, alternate with and shorter than the segments of the calyx, with the inside of the tube of which their claws are so closely incorporated as to resemble 4 petals almost sessile at the top of the tube. Torus cylindrical, at length longer than the tube of the calyx. Stamens numerous; filaments below united with the torus, free above. Ovarium ovoid or cylindrical, 1-celled: ovules numerous. Berry ovate or elongated, stalked.—The stamens appear as if they were entirely distinct, springing from the summit of the torus. The apetalous species have trifoliolate leaves; the tetrapetalous simple.

78. (1) N. *linearis* (DC.:) leaves trifoliolate; leaflets ovate, oblong, or linear, with a recurved mucro, minutely wrinkled so as to appear pitted, shorter than the petiole: racemes terminal: calyx-tube campanulate: petals none: ovarium and fruit ovoid: seed solitary?—*DC. prod.* 1. *p.* 244; *Wall. L. n.* 6975; *Wight! cat. n.* 100.—Capparis apetala, *Roth. nov. sp. p.* 238.—C. linifolia, *Roxb. hort. Bengh. p.* 41.—Cratæva apetala, *Spr. syst.* 2. *p.* 448.

79. (2) N. *oblongifolia* (DC.:) leaves simple, oval-oblong, mucronate: calyx-tube narrow-obconical: petals equal, lanceolate, waved, acute, scarcely half the length of the divisions of the calyx: ovarium cylindrical: fruit constricted around each seed, forming an elongated twisted and knotted berry; each

Digitized by Google

lobe or knot one-seeded.—α; leaves notched at the extremity.—*Wight! cat. n.* 86. *a*; *Wall.! L. n.* 6976. *e.*—N. arenaria, *DC. prod.* 1. *p.* 244.—β; leaves retuse or obtuse.—*Wight! cat. n.* 86.—N. oblongifolia, *DC. prod.* 1. *p.* 244; *Wall.! L. n.* 6976. *c. e.*—Capparis heteroclita, *Roxb. fl. Ind.* 2. *p.* 570.—Cratæva oblongifolia, *Spr. syst.* 2. *p.* 448.—γ; leaves ovate, acuminated.—*Wight! cat. n.* 85; *Wall.! L. n.* 6976. *a.*——α from about Courtallam; γ from Cuddalore.

Certainly only one species: indeed the leaves vary on the same individual, so that it is scarcely possible to limit the varieties. The singular fruit is caused by the placentæ becoming indurated and nearly straight, while the seeds bulge out the side of the berry; so that it has the appearance of several berries placed along a receptacle. The ovarium is erroneously described by Roxburgh, and is certainly unilocular.

VI. CADABA. *Forsk.*

Calyx of 4 sepals; 2 interior, smaller and more coloured than the outer ones. Petals 4 or 2 with long claws, or none. Torus (*nectary* of authors) elongated, somewhat infundibuliform, erect, bearing the elongated ascending thecaphore (or fruitstalk) at its base on the opposite side from the two middle petals. Stamens 4–6: filaments free above, united below into a column, which surrounds and firmly coheres with the thecaphore for nearly half its length. Fruit bacate, cylindrical, many-seeded.—Shrubs with simple or rarely trifoliolate leaves, usually without thorns.

80. (1) C. *Indica* (Lam.:) without thorns: leaves from elliptic-oblong to broad-lanceolate, mucronate, glabrous: torus tubular, mouth oblique, widening, toothed: petals and stamens 4: seeds immersed in firm pulp.—*DC. prod.* 1. *p.* 244; *Wall.! L. n.* 6977; *Wight! cat. n.* 81.—Cleome fruticosa, *Linn.; Burm. fl. Ind. t.* 46. *f.* 3.—Strœmia tetrandra, *Vahl; Spr. syst.* 1. *p.* 766; *Roxb. fl. Ind.* 2. *p.* 78.——Very common, especially in a dry soil, or among rubbish.

81. (2) C. *trifoliata* (W. & A.:) without thorns: leaves trifoliolate; leaflets ovate-oblong, petioled, glabrous: torus infundibuliform; limb folded back on one side with a few teeth on its margin: petals 2: stamens 6: fruit dry within, imperfectly dehiscent from the base upwards: seeds remaining attached to the placentæ.—*Wight! cat. n.* 80.—C. triphylla, *Wight! in Hook. Bot. misc. supp. tab.* 37.—Strœmia trifoliata, *Roxb. fl. Ind.* 2. *p.* 79.—Desmocarpus missionis, *Wall. L. n.* 6978.——Courtallum and Pathucottah.

This species has so many remarkable characters in common with the others of the genus, that we are not disposed to separate it on account of the trifoliolate leaves, and structure of the fruit.

VII. CAPPARIS. *Linn.; Lam. ill. t.* 446.

Calyx of 4 sepals. Petals 4, sessile. Torus inconspicuous. Stamens numerous, distinct. Siliqua more or less baccate, stalked.—Shrubs with simple entire leaves.

In the Indian and New Holland species the flower-buds are globular; the sepals ovate, concave, obtuse, imbricated, and unequal; and the thecaphore long.

§ 1. *Pedicels axillary, solitary or rarely 2–3 from the same point.*

82. (1.) C. *brevispina* (DC.:) stipules thorny, short, straightish: leaves short-petioled, varying from broad-lanceolate to broadly oval, more or less acute, mucronate, coriaceous, glabrous, reticulated, paler beneath: pedicels slender, axillary, solitary, 1-flowered, a little shorter than the leaves: ovarium oblong, densely pubescent: berry roundish with an even surface.—C.

Digitized by Google

acuminata, *Roxb. fl. Ind.* 2. *p.* 566 (not *Willd.*)—*α*; leaves ovate or oblong, lanceolate.—*Wight! cat. n.* 99.—C. brevispina, *DC. prod.* 1. *p.* 246; *Spr. syst.* 2. *p.* 573.—*β*; leaves oval, oblong, acute.—*Wight! cat. n.* 97.—C. Rheedii, *DC.! prod.* 1. *p.* 246 (excluding the synon. of *Rheede*); *Spr. syst.* 2. *p.* 573.—C. Wightiana, *Wall.! L. n.* 6987. *a.*—*γ*; leaves roundish-ovate, slightly cordate at the base.—*Wight! cat. n.* 101.—C. rotundifolia, *Rottl. and Willd.*; *DC. prod.* 1. *p.* 245; *Spr. syst.* 2. *p.* 573.——Malabar, and perhaps the Coromandel coasts.

Roxburgh's description is excellent: he was well aware of the variable shape of the leaves: the specimen from him seen by De Candolle belongs to our *α*, while the figure transmitted to the India House Museum (tab. 656.) represents our *γ*. Perhaps future observations may do away even with the permanency of the varieties. The name given by Rottler and Willdenow is not applicable to all the states, hence we have taken the later one.

83. (2) C. *pyrifolia* (Lam.:) stipules thorny, short, hooked: leaves between ovate and oval-lanceolate, mucronate; the younger ones densely pubescent, older ones glabrous: pedicels short and stout, axillary, solitary, 1-flowered, 2–3 times longer than the petiole: ovarium narrow-oblong, glabrous, furrowed.—*Lam. encycl. meth.* 1. *p.* 606 (var. *α*); *DC. prod.* 1. *p.* 246; *Spr. syst.* 2. *p.* 573; *Wight! cat. n.* 94.—C. grandiflora, *Wall.! cat. n.* 6984.——In the mountainous districts.

84. (3) C. *stylosa* (DC.:) stipules thorny, short, nearly quite straight; leaves from linear-lanceolate to elliptical, mucronate, glabrous, 5-nerved at the base, otherwise feather-nerved; nerves parallel, nearly simple, converging towards the point of the leaf; pedicels short and stout, axillary, solitary, 1-flowered, about 2 or 3 times longer than the petiole: ovarium glabrous, globose, suddenly attenuated into a thickish style: berry globose, warted, crowned by the shortish thick style.—*α*; leaves narrow-lanceolate, acute.—*Wight! cat. n.* 95.—C. stylosa (*α*), *DC. prod.* 1. *p.* 246; *Spr. syst.* 2. *p.* 573; *Wall.! cat. n.* 6980. *a.* (corrected at p. 250. to *C. brevispina*).—C. horrida, *Herb. Banks!*—*β*; leaves nearly elliptical.—*Wight! cat. n.* 96; *Wall.! L. n.* 6980. *c.*—*Pluk. t.* 107. *f.* 3?

85. (4) C. *Wallichiana* (W. & A.:) stipules thorny, very short, straight: leaves on longish petioles, elliptic-oblong, feather-nerved, slightly reticulated; young ones thin, smoothish, and shining above, tomentose beneath; old ones glabrous: pedicels slender, axillary, solitary, 1-flowered, 4 or 5 times longer than the petiole: ovarium oblong, densely pubescent.—*Wight! cat. n.* 98.

This has the same form of leaves as *C. bisperma*, Roxb., but has the pedicels all axillary, and not forming a leafless raceme.

86. (5) C. *Heyneana* (Wall.:) stipules thorny, very minute, straight; leaves ovate or obovate, lanceolate, glabrous, 3-nerved at the base, otherwise feather-nerved; nerves few, sunk above, very prominent beneath, principally springing from the midrib in the lower part of the leaf, and there parallel, simple, converging to the apex: pedicels pretty stout, axillary or terminal at the top of the shoots, solitary, 1-flowered, 3–4 times longer than the petiole: ovary oblong, densely pubescent.—*Wall.! L. n.* 6985; *Wight! cat. n.* 87.—*Rheed. Mal.* 6. *t.* 57. (not *C. Rheedii*, DC.)——Cochin, in Travancore. Courtallum.

Leaves from 3 to 4 inches long.

§ 2. *Pedicels* 1-*flowered, springing from the stem in a line one above the other, a little above the axils of the leaves* (supra-axillary).

87. (6) C. *Zeylanica* (Linn.:) stipules terete, thorny, short, straight: leaves varying from broadly oval acuminated at each end, to ovate; young ones tomentose beneath; older ones glabrous: pedicels supra-axillary, 2–4 in a

Digitized by Google

vertical line, approximate, about half the length of the leaf.—*DC. prod.* 1. *p.* 247; *Spr. syst.* 2. *p.* 573; *Wight! cat. n.* 93.—C. acuminata, *Willd. sp.* 2. *p.* 1131; *DC. prod.* 1. *p.* 247; *Spr. Syst.* 2. *p.* 573.

The specimen before us, obtained from the Madras or Missionary herbarium, and named *C. acuminata*, is therefore the plant of Willdenow; but we do not think it can be separated from *C. Zeylanica*. *C. acuminata* of Roxburgh we have already referred to; the plant of Wallich! (L. n. 6990) is a new species quite distinct from either. We do not know the *C. Zeylanica* of Wallich's List, n. 6989, which perhaps contains more than one species.

88. (7) C. *horrida* (Linn.:) stipules laterally compressed, thorny, hooked: leaves from elliptic-oblong to broadly ovate, with a longish broad rigid mucro; older ones glabrous; younger ones beneath, and branchlets and sepals, densely pubescent: pedicels supra-axillary, 2–4 in a vertical line, unequal; lower one about equal to the petiole; upper ones longer: ovarium glabrous, globose, pointed.—*DC. prod.* 1. *p.* 246; *Spr. syst.* 2. *p.* 573; *Wall.! L. n.* 6981. *a–e*; *Wight! cat. n.* 90. 92.—C. terniflora, *DC. prod.* 1. *p.* 247; *Spr. syst.* 2. *p.* 574.—C. quadriflora, *DC. prod.* 1. *p.* 247; *Spr. syst.* 2. *p.* 574.—C. pyrifolia, β, *Lam.*—C. Zeylanica, *Herb. Banks!*; *Roxb. fl. Ind.* 2. *p.* 567.

It is difficult to say whether Pluk. phyt. t. 107. f. 3. belongs to this or to *C. stylosa*.

§ 3. *Pedicels forming a corymb or raceme.*

89. (8) C. *bisperma* (Roxb.:) arborescent: stipules thorny, on the lower branches recurved, on the young shoots very small or often wanting: leaves oval-oblong, obtuse or retuse, slightly cuneate at the base, glabrous: peduncles racemose, lower ones axillary, about half the length of the leaf; upper ones with bracteas shorter than themselves: ovarium globose?: berry nearly globose, 2-seeded.—*Roxb. hort. Bengh. p.* 93; *fl. Ind.* 2. *p.* 568; *Wight! cat. n.* 104 *?*—C. maxima, *Roxb. in E. I. C. mus. tab.* 156.—C. grandis, *Herb. Klein.!*——Coromandel; *Roxburgh.*

Our character is taken entirely from Roxburgh's figure and description. The only specimen we have seen is from Klein's herbarium, from Putland in Ceylon; but it is so exceedingly imperfect, that we have been principally guided in referring it here by the attached name, *C. grandis*, with which Roxburgh also compares his plant. May this and our *C. Wallichiana* eventually prove to be the same species?; the petals in both are oblong, but in *C. Wallichiana* they are double the size of those in Roxburgh's figure of *C. disperma*.

90. (9) C. *Roxburghii* (DC.:) shrubby: stipules thorny, recurved, hooked: leaves elliptic-oblong, obtuse, tapering at the base, glabrous: racemes terminal, corymbiform, leafless: ovarium obovoid?: berry globose, many-seeded.——*DC. prod.* 1. *p.* 247.—C. corymbosa, *Roxb. hort. Bengh. p.* 93; *fl. Ind.* 2. *p.* 569.—C. aguba, *Roxb. in E. I. C. mus. tab.* 158.——Coromandel; *Roxburgh.*

Flowers much larger than the last, and petals broadly obovate. Our character is taken from Roxburgh's figure and description.

91. (10) C. *incanescens* (DC.:) shrubby: branches diffuse, very flexuose, somewhat dichotomous: stipules thorny, hooked: leaves elliptic-oblong, mucronulate; young ones and branches hoary with adpressed pubescence: corymbs many-flowered, almost umbelliform, sessile or nearly so: pedicels and calyx glabrous: ovarium globose, pointed, glabrous.—*DC. prod.* 1. *p.* 247; *Wall.! L. n.* 6994; *Wight! cat. n.* 106.—C. stylosa, β velutina, *DC.! prod.* 1. *p.* 246.——Southern provinces.

Perhaps this is a mere variety of the following.

92. (11) C. *sepiaria* (Linn.:) shrubby: stipules thorny, hooked: leaves roundish ovate or broadly elliptical, emarginate; young ones beneath, as well as the branches, pubescent; older ones almost or quite glabrous: corymbs many-flowered, almost umbelliform, sessile: pedicels and calyx glabrous:

Digitized by Google

ovarium globose, pointed, glabrous: berry globose, 1-seeded.—*DC. prod.* 1. *p.* 247; *Spr. syst.* 2. *p.* 575 (excluding synon.); *Roxb. fl. Ind.* 2. *p.* 568; *Wall.! L. n.* 6993; *Wight! cat. n.* 105.——Coromandel and elsewhere, not uncommon.

An excellent plant for hedges. Flowers small, in both this and the last; petals oblong, scarcely more than a line and a-half long.

93. (12) C. *pedunculosa* (Wall.:) stipules thorny, hooked: leaves roundish ovate, obtuse, cordate at the base, very shortly petioled, glabrous: umbels sessile, terminal, often on very short axillary branches, few (2–5)-flowered: pedicels and calyx glabrous: ovarium globose, pointed, glabrous: fruit globose, with several seeds.—*Wall.! L. n.* 6999; *Wight! cat. n.* 89.——Near Point Calamere in Tanjore.

94. (13) C. *grandis* (Linn.:) shrubby: stipules none on the younger branches; extremely short and resembling a small sharpish wart on the older: leaves roundish-ovate, usually cuneate at the base, acute or somewhat obtuse at the apex, glabrous above, pubescent beneath; older ones almost glabrous: racemes terminal, at the end of the branches, or on axillary branchlets, between longish-corymbiform and almost umbelliform: pedicels and calyx pubescent: ovary globose, pointed, glabrous: berry globose, 2-seeded.—*α*; leaves somewhat glaucous beneath, pubescence scanty.—*Wight! cat. n.* 103.—C. grandis, *Linn.; DC. prod.* 1. *p.* 248; *Spr. syst.* 2. *p.* 574; *Wall. L. n.* 6996. *e* ?—C. racemifera, *DC. prod.* 1. *p.* 248 ? *Spr. syst.* 2. *p.* 576 ?—*β*; leaves with close, adpressed, greyish or almost silvery pubescence.—*Wight! cat. n.* 102.—C. grandis, *Wall.! L. n.* 6996. *b.*—C. obovata, *Ham.! in DC. prod.* 1. *p.* 248; *Spr. syst.* 2. *p.* 574.—C. maxima, *Heyne in Roth. nov. sp. p.* 237; *DC. prod.* 1. *p.* 248; *Wall. L. n.* 6995.——Mysore and Travancore.

95. (14) C. *diversifolia* (W. & A.:) shrubby: stipules short, hooked: leaves on the older branches linear, acuminated; on the younger oblong-lanceolate, acuminated; all mucronate, reticulated, quite glabrous: corymbs umbelliform, sessile at the extremities of the narrow-leaved branches, few (2–8)-flowered: pedicels about equal to the calyx, and with it puberulous: ovary narrow-oblong, glabrous.—*Wight! cat. n.* 952.

96. (15) C. *aphylla* (Roxb.:) glabrous: stipules thorny, short, nearly straight: leaves (on the young shoots only) linear-subulate, mucronate, almost twice the length of the stipules, caducous: flowers corymbose; corymbs nearly sessile, from the axils of the stipules: ovarium globose, pointed, glabrous.—*Roxb. hort. Bengh. p.* 41; *Roth. nov. sp. p.* 238; *DC. prod.* 1. *p.* 246; *Spr. syst.* 2. *p.* 573; *Wall.! L. n.* 6983. *a. d.* (and probably the others); *Wight! cat. n.* 91.——Siwalaperi near Tuticorin, in the district of Tinnevelly; *Klein; Rottler; Heyne.*

Species scarcely known.

97. (16) C. *divaricata* (Lam.:) glabrous: stipules thorny short, curved: leaves very shortly petioled, exactly linear, elongated, mucronate, coriaceous.—*DC. prod.* 1. *p.* 252; *Wight! cat. n.* 88.—C. horrida, *var.* angustifolia, *Herb. Banks.*

Neither flower nor fruit have been examined by us: the section to which it belongs is therefore doubtful: it is readily distinguished by being quite glabrous, and by its leaves scarcely above a line wide, although almost two inches long. The stipules are divaricated or parallel on the same specimen. Perhaps it may prove a young vigorous shoot of *C. aphylla.* We do not know whether Wallich's List n. 6988 is referable here or not.

†98. (17) C. *reticulata* (Klein.)—*Wall. L. n.* 6986.—C. cœrulea, *Herb. Heyne.*

Perhaps the same as *C. brevispina.*

Digitized by Google

† 99. (18) C. *uncinata* (Wall. L. n. 6998.)——Neelgherries; *Notan.*

† 100. (19) C ? *malabarica* (Heyne.)—*Wall. L. n.* 7000.

† 101. (20) C. *Russeliana* (Wall. L. n. 7001.)—C. grandis, *Herb. Russel.*

ORDER XII.—RESEDACEÆ. *DC.*

Calyx of 4–6 persistent sepals, or rotate and 5-toothed: æstivation open. Petals rarely none, usually as many as and alternate with the segments of the calyx, furnished with broad claws, upper and lateral ones fringed or cleft: æstivation open. Stamens 2–4 times as many as the calycine segments: filaments more or less and variously united: anthers bilocular, erect, opening longitudinally. Torus very short, or resembling a stipes, bearing usually under the stamens an obtuse nectariferous scale. Carpels 3–6, each with 1 style, distinct, or united together into a single ovarium. Fruit of 3–6 few-seeded follicles, dehiscing internally; or an unilocular polyspermous, 3–6 valved capsule, indehiscent except at the apex; or fleshy, unilocular, and polyspermous. Placentæ parietal. Seeds somewhat pendulous; testa crustaceous. Albumen very thin, between fleshy and membranaceous. Embryo curved terete: radicle superior: cotyledons fleshy, semicylindrical.—Herbaceous plants, with alternate leaves; stipules none, or represented by glands. Flowers on short pedicels.

I. RESEDA. *Linn.; Lam. ill. t.* 410; *Gærtn. fr. t.* 75.

Sepals 4–6. Petals 4–6, unequal. Stamens 10–24. Carpels 3–6, united into a 3–6 angled 1-celled capsule, opening at the apex, and crowned with 3–6 styles. Placentæ alternate with the styles, bearing numerous seeds in a double row. Seeds with a dotted testa.

102. (1) R. *alba* (Linn.:) leaves deeply pinnatifid: lobes linear-oblong, entire, often waved, margin scabrous: sepals 5: petals all with a simple claw expanding into the 3-fid limb. Styles 4 or rarely 3, persistent, connivent at the apex: fruit crowded.—*Spr. syst.* 2. *p.* 464; *Wight! cat. n.* 955.—R. undata, *Linn.; Spr. syst.* 2. *p.* 464.——Neelgherries.

ORDER XIII.—FLACOURTIANEÆ. *Rich.*

Sepals 4-7, cohering slightly at the base. Petals equal in number to, and alternate with, the sepals, sometimes wanting. Stamens hypogynous, equal in number to the petals or some multiple of them, occasionally changed into nectariferous scales. Ovary roundish, sessile or slightly stalked: style none, or filiform: stigmas several, more or less distinct. Fruit unilocular, containing a thin pulp, either fleshy and indehiscent, or capsular with 4–5 valves. Placentæ parietal, branching over the inner surface of the valves. Seeds few, thick, often enveloped in a pellicle formed by the withered pulp. Albumen fleshy, somewhat oily. Embryo straight, in the axis of the albumen: radicle turned to-

Digitized by Google

wards the hilum: cotyledons flat, foliaceous.—Leaves alternate, simple, without stipules. Flowers sometimes unisexual.

I. FLACOURTIA. *L'Her. st. t. 30; Lam. ill. t. 826.*

Flowers apetalous, usually dicœcious. MALE. Stamens arranged closely on the dilated torus, not surrounded by a gland at their base: anthers nearly globose. FEM. Calyx deciduous. Ovarium sometimes attenuated at the apex, but without a style. Stigmata 4–9, radiating, linear, furrowed above, dilated and emarginate at the apex. Seeds bony.—Shrubs usually thorny. Leaves occasionally serrated, toothed, or crenated on the same individual. Peduncles axillary, bearing several flowers.

*103. (1) F. *Ramontchi* (L'Her.:) arborescent: thorns few, naked: leaves between roundish-ovate and oblong; young ones mucronate; older ones somewhat obtuse, membranaceous: flowers dicœcious: stigmas 5–9.—*DC. prod. 1. p. 256; Spr. syst. 2. p. 607; Wall.! L. n. 6677; Wight! cat. n. 108.* —Stigmarota Africana, *Lour. Cochin. p. 779.*

104. (2) F. *sapida* (Roxb.:) shrubby, thorns scattered, naked: leaves elliptical-obtuse, older ones membranaceous: flowers dicœcious: stigmas 5–7. —*Roxb. Cor. 1. p. 49. t. 69; DC. prod. 1. p. 256; Spr. syst. 2. p. 607; Wall.! L. n. 6675; Wight! cat. n. 107.*

Except the trifling points noticed in the characters, and that the present has smaller leaves than *F. Ramontchi*, we cannot see any difference between them.

105. (3) F. *sepiaria* (Roxb.:) shrubby: thorns very numerous, patent, bearing leaves and flowers: leaves obovate-oblong; older ones very rigid and coriaceous: flowers dicœcious: stigmas 3–4.—*Roxb. Cor. 1. p. 48. t. 68; DC. prod. 1. p. 256; Spr. syst. 2. p. 607; Wall.! cat. n. 6676; Wight! cat. n. 109.* —*Rheed. Mal. 5. t. 39.*

106. (4) F. *inermis* (Roxb.:) arborescent: thorns none: leaves ovate: flowers bisexual: stigmas 4–5.—*Roxb. Cor. 3. t. 222; DC. prod. 1. p. 256; Spr. syst. 2. p. 607; Wall.! L. n. 6673; Wight! cat. n. 13.*

Dr Wallich suggests that this may be a species of *Roumea*, probably owing to the sepals persisting longer than usual; but in Poiteau's *Roumea* there seem to be other characters, which are wanting in *F. inermis*. What Dr Wallich calls *Roumea* is a genus different from either Poiteau's or *Flacourtia*; for it we retain Loureiro's name of *Phoberos*. *Roumea inermis*, DC. (*Bessera inermis*, Spr.) does not appear to belong to the order. *Stigmarota Jangomas* of Loureiro and De Candolle is an undoubted *Flacourtia*, and apparently not distinct from *F. cataphracta*, Roxb.

II. PHOBEROS. *Lour.*

Flowers apetalous, bisexual. Calyx 10–12-parted, persistent; segments in a double row, rounded; the 5–6 interior usually unequal, some of them similar to, others smaller than, the exterior. Stamens numerous, inserted on the expanded torus: filaments filiform: anthers versatile, 2-celled, and opening by two clefts at the base; connectivum produced much beyond the anthers, into a long-attenuated bluntish horn. Style elongated, tapering, stout: stigma capitate, angled, marked above with 3–4 furrows. Berry 3–4-seeded.—Leaves alternate, crenato-serrate; serratures glanduliferous.

107. (1) P. *crenatus* (Wight:) without thorns?: leaves elliptic-oblong, lanceolate, acute and without glands at the base, obtusely serrated; veins

Digitized by Google

scarcely prominent beneath.—*Wight! cat. n.* 62.—Flacourtia crenata, *Wall.! L. n.* 6679 (partly.)——Neelgherries.

108. (2) P. *lanceolatus* (Wight:) without thorns?: leaves oblong-lanceolate, acuminated, slightly and obtusely serrated, without glands at the base, beneath paler with the veins prominently reticulated.—*Wight! cat. n.* 63.—Flacourtia crenata, *Wall.! L. n.* 6679 (partly.)——Neelgherries.

The flowers are larger, and the specimen before us has quite a different appearance from *P. crenatus*.

109. (3) P. *Wightianus* (W. & A.:) very thorny: leaves roundish-ovate with a short obtuse acumination, without glands at the base, scarcely serrate, the serratures often resembling mere glands, very coriaceous and hard, beneath somewhat prominently reticulated.—*Wight! cat. n.* 64.—Flacourtia Wightiana, *Wall. L. n.* 6672?

We believe this is also from the Neelgherries; it was sent formerly to Dr Wallich marked "*Phoberos*," and our only uncertainty arises from his not having quoted that synonym in his list.

* 110. (4) P. *macrophyllus* (W. & A.:) arborescent, thorny: leaves broadly lanceolate, acuminated, obtuse or somewhat truncate at the base, bearing there a gland on each side of the petiole.—*Wight! cat. n.* 288.—Flacourtia inermis? *Wall.! L. n.* 6673. *g, h.*

Our specimens are from Klein's herbarium. It is cultivated in the missionary garden, and is said to have come from Ceylon. Klein describes it as an arborescent thorny shrub, with a dry berry: the upper branches are free from thorns. The *P. chinensis* of Loureiro, which Mr Arnott has in his herbarium from Canton, has likewise a gland on each side of the petiole at the base of the leaf, but the leaves are very coriaceous, nearly entire, and elliptical, with scarcely any acumination.

III. HYDNOCARPUS. *Gærtn. fr. t.* 60.

Flowers dicœcious. Sepals 5; the two outer ones ovate; the three inner much larger, exceedingly concave, somewhat petaloid; æstivation twisted. Petals 5, fringed with close soft snow-white hairs: æstivation twisted. Scales (abortive stamens?) 5, almost half the size of the petals to which they are opposite, somewhat fleshy, densely hairy. MALE. Stamens 5, in the centre of the flower; filaments subulate, hairy at the base: anthers flattish, nearly reniform; cells separated by the broad connectivum. No vestiges of a pistil. FEM. Stamens as in the male, but anthers without pollen. Style 0. Stigma peltate, flat, closely pressed on the summit of the ovary and crowning it, 5-parted; each segment cuneate and deeply bifid. Ovarium globose; ovules numerous. Berry globose, crowned with the undivided portion of the stigma now thickened and erect (resembling a short stout style) and bearing the remains of its lobes. Seeds numerous.—Trees. Leaves glabrous; secondary nerves simple, connected with transverse small nearly simple and straight veins.

111. (1) H. *inebrians* (Vahl.)—*Vahl, symb.* 3. *p.* 100; *DC. prod.* 1. *p.* 257; *Spr. syst.* 1. *p.* 792; *Wall.! L. n.* 6670; *Wight! cat. n.* 110.——Malabar coast, common.

Vareca moluccana, Roxb., and perhaps his other species, cannot be united to *Hydnocarpus* as Sprengel has done; they seem to form a genus among the *Bixineæ*.

Digitized by Google

ORDER XIV.—BIXINEÆ. *Kunth.*

Sepals 4–7, distinct, or cohering at the base: æstivation imbricated. Petals five, hypogynous, resembling the sepals, or none. Stamens hypogynous, indefinite, distinct, inserted on the discoid torus: anthers bilocular. Ovary sessile, 1-celled: ovules attached to 2–7, narrow, parietal placentæ: style single, or 2–4 cleft. Fruit capsular or baccate, 1-celled, many seeded; placentæ in the middle of the valves. Seeds enveloped in pulp. Albumen fleshy, or very thin, including the embryo, which is slightly curved: radicle pointing to the hilum: cotyledons foliaceous.—Leaves alternate, simple, with deciduous stipules.

Mr Don is disposed to adopt the name *Prockiaceæ* for this order, and to remove *Bixa*, with *Sloanea* and *Ablania*, to the neighbourhood of the *Tiliaceæ*.

I. BIXA. *Linn; Lam. ill. t.* 469; *Gærtn. fr.* 1. *t.* 61.

Sepals 5, orbicular, tuberculate at the base, deciduous. Petals 5, obovate, entire. Stamens numerous, distinct: filaments filiform: anthers ovate. Style single, elongated, so compressed at the apex as to be almost ligulate. Capsule 2-valved: valves prickly on the outside, bearing a linear placenta internally along their middle. Seeds 8–10 attached to each placenta, surrounded by a farinaceous coloured pulp. Albumen fleshy.—Trees with broad cordate leaves, and dichotomous panicles of large flowers.

112. (1) B. *Orellana* (Linn.:) leaves cordate, ovate, acuminated, entire or angular, free from scales on both surfaces: fruit nearly globose.—*DC. prod.* 1. *p.* 259; *Spr. syst.* 2. *p.* 594; *Roxb. fl. Ind.* 2. *p.* 581; *Wall.! L. n.* 1067; *Wight! cat. n.* 111.—*Rumph. Amb.* 2. *t.* 19.

ORDER XV.—VIOLARIEÆ. *DC.*

Sepals five, persistent; æstivation imbricated. Petals hypogynous, five, usually withering, generally unequal; æstivation obliquely convolute. Stamens five, alternate with the petals, or occasionally opposite to them, inserted on the hypogynous disc or torus: anthers bilocular, introrse, closely approximated or united laterally to each other: filaments dilated, elongated beyond the anthers; two of them, in the irregular flowers, usually with an appendage at the base. Ovary 1-celled, with many (rarely one) ovules: style single, usually declinate, with an oblique cucullate stigma. Capsule three-valved, loculicide, bearing the placenta on the middle of the valves. Embryo straight, erect, in the axis of a fleshy albumen.—Leaves alternate, rarely opposite, with persistent stipules and an involute vernation.

I. VIOLA. *Linn.; Lam. ill. t.* 725; *Gærtn. fr. t.* 112.

Sepals unequal, all more or less auricled at the base, erect after flowering. Petals unequal, convolute in æstivation; lower one more or less produced downwards and backwards into a kind of hollow spur. Stamens very close

Digitized by Google

together, inserted at the apex of the pentagonal 5-toothed torus; the two anterior ones bearing on their back two nectariferous processes contained within the spur: filaments distinct, dilated at the base, bearing the anthers low down: anthers connate; lobes diverging at the base. Ovarium sometimes girded round at the base by the concave torus (or apparently half-inferior.) Capsule valves contracting elastically and scattering the ripe seeds. Seeds horizontal, with an evident carunculus, somewhat ovoid and shining. —Low herbaceous plants, rarely annual, usually perennial, sometimes with a very short or subterraneous stem (then called stemless), sometimes caulescent, and rarely somewhat shrubby. Leaves alternate, withering. Peduncles solitary 1-flowered, not jointed; furnished with two little bracteoles, recurved at the apex before flowering, afterwards erect.

113. (1) V. *Patrinii* (DC.:) root woody, somewhat branched, its trunk hardish: leaves glabrous, oblong-lanceolate, obtuse, truncate at the base, crenated; petioles winged, 1½–3 times longer than the leaf; stipules adhering to the petiole for half their length: sepals lanceolate: torus flattish: style attenuated downwards: stigma rostrate, triangular, margined: valves of the fruit straightish, somewhat truncated.—*DC! prod. p.* 293; *Spr. syst.* 1. *p.* 798; *Wight! cat. n.* 113.—V. Chinensis, *G. Don.*—V. primulæfolia, *Linn.* (partly); *Lour. fl. cochin.* 2. *p.* 628.—V. Notaniana, *Wall. L. n.* 1449?——Neelgherries.

We place no dependence on the petals being bearded, the allied *V. primulæfolia* from North America proving how inconstant that character is. We suspect also that *V. cæspitosa*, Don (*V. Patrinii* var. *Nepalensis* DC. and Wall. L. n. 1445), may be a short petioled variety.

114. (2) V. *Wightiana* (Wall.:) stoloniferous, slightly hairy: leaves cordate-ovate, crenated: sepals lanceolate, somewhat acute: spur short, very blunt: torus flattish: style attenuated downwards: stigma rostrate, convex but not hooked, neither margined nor papillose: fruit globose?—*Wall.! L. n.* 4021; *Wight! cat. n.* 112.——Neelgherries.

Too closely allied to *V. odorata;* nor can we point out any differences except the smaller petals, narrower and more acute sepals, and stigma not hooked, all of which may have arisen from the different climate of the East.

† 115. (3) V. *Mysorensis* (Wall. L. n. 1446.)

Of this we know nothing: the plant associated with it doubtfully by Dr Wallich from Hamilton's herbarium, is *V. primulæfolia*, Roxb. fl. Ind. 1. p. 650. (not Willd.), and is a species that differs principally from *V. Patrinii* and *V. ovata* Nutt, by the leaves triangular and acute.

II. IONIDIUM. *Ventn.*

Sepals small, unequal, without auricles; margin membranaceous. Petals unequal; lower one 2–3 times longer than the others, more or less unguiculate, carinately concave and a little gibbous at the base of the unguis in front; margins usually involute in æstivation. Stamens close together: filaments distinct, bearing the anthers low down, not terminated with bristles; the two anterior ones usually furnished with a nectarial gland at the base. Capsule-valves not elastic.—Herbaceous or suffrutescent low plants. Peduncles solitary 1-flowered, jointed, bearing two bracteoles above the middle.

116. (1) I. *suffruticosum* (Ging.:) stems pubescent, branched near the base; branches nearly simple: lower leaves the broader, upper ones oblong-lanceolate, mucronate, more or less pubescent, toothed or serrated; stipules subulate: sepals narrow, acuminated, strongly keeled: lower petal nearly

Digitized by Google

orbicular, obtuse, long-unguiculate: capsule nearly globose: seeds 9, obovoid, shining (whitish), longitudinally furrowed.—*DC. prod.* 1. *p.* 311; *Wall.! L. n.* 1439; *Wight! cat. n.* 115.—I. enneaspermum, *DC. prod.* 1. *p.* 308? (scarcely of *Ventn.*)—I. frutescens, *Ging. in DC. prod.* 1. *p.* 311.—I. Wightianum, *Wall. L. n.* 4020?—Viola suffruticosa, *Linn.; Roxb. fl. Ind.* 1. *p.* 649; *Roth. nov. sp. p.* 165.—V. frutescens, *Roth. nov. sp. p.* 166.—Solea enneasperma, *Spr. syst.* 1. *p.* 804.—*Rheed. Mal.* 9. *t.* 60.——Madras and elsewhere, not uncommon.

Exceedingly variable, both as to the shape of the leaves and their pubescence. In some situations the stems are nearly erect, and the whole plant has the appearance of an annual; in others they are prostrate, and perfectly suffrutescent, like a *Helianthemum*.

117. (2) I. *enneaspermum* (Ventn.:) stems branched: lower leaves the broader, upper ones linear-lanceolate; stipules subulate: sepals narrow, acuminated, slightly keeled: lower petal nearly orbicular, acute at each end, long-unguiculate: capsule somewhat globose: seeds 9, obovoid, shining (whitish), longitudinally furrowed.—*Wall. L. n.* 1438; *Wight! cat. n.* 114. —I. heterophyllum, *Ventn.; DC. prod.* 1. *p.* 308.—I. capense γ Burmanni, *DC. prod.* 1. *p.* 308.—I. erectum, *Ging. in DC. prod.* 1. *p.* 311.—Viola enneasperma, *Linn.; Roxb. fl. Ind.* 1. *p.* 650?—V. erecta, *Roth. nov. sp. p.* 165.—Solea erecta, *Spr. syst.* 1. *p.* 804.—*Pluk. t.* 120. *f.* 8; *Burm. Zeyl. t.* 85?

Some specimens are perfectly pubescent, others quite glabrous. It is a more erect and twiggy species than the last, and has much smaller flowers.

†118. (3) I. *leptorrhizum* (DC.:) "stem simple or sparingly branched, nearly glabrous: leaves alternate, glabrous, somewhat glaucous, ovate, acute, shortly tapering into the petiole, toothed; stipules linear-subulate: sepals very acute."—*DC. prod.* 1. *p.* 308.——Malabar and Tranquebar; *Herb. Banks.*

Perhaps a mere state of *I. suffruticosum*. We exclude the synonyms adduced by De Candolle; that of Plukenet belonging to our last species; that of Rheede (Mal. 9. t. 61) to *Polygala arvensis*.

ORDER XVI.—DROSERACEÆ. *DC.*

***Sub-ord.* 1. Droseræ (*Arn.*)** **Sepals 5, persistent, equal: æstivation imbricative. Petals 5, hypogynous. Stamens hypogynous, distinct, withering, five and alternate with the petals, or ten: anthers bilocular, bursting longitudinally. Ovary one: styles 3–5, slightly connected at the base or distinct, bifid or branched. Capsule 3–5-valved, loculicide, 1-celled, or spuriously 3-celled, the dissepiments being formed by the placentas meeting in the axis. Seeds without an arillus; testa sometimes loose and distinct from the tegmen. Embryo straight, erect, in the axis of a fleshy or cartilaginous albumen.—Leaves alternate, furnished (except in *Aldrovanda*) with glandular hairs, with a circinate vernation. Stipules in the form of ciliæ at the base of the petioles.**

I. DROSERA. *Linn.; Lam. ill. t.* 220; *Gærtn. fr. t.* 61.

Stamens 5. Styles 3–5, 2–3-parted or multifid. Capsule globose, opening with 3–5 valves at the top. Seeds small, numerous.—Herbaceous plants growing in marshy places. Leaves furnished with numerous long reddish glanduliferous hairs.

Digitized by Google

119. (1) D. *Burmanni* (Vahl:) stemless: leaves all radical, obovate-cuneate, sessile, veins reticulated: scapes erect, and the calyx glabrous: seed-coat not arilliform.—*DC. prod.* 1. *p.* 318; *Spr. syst.* 1. *p.* 955; *Roxb. fl. Ind.* 2. *p.* 113; *Wall.! L. n.* 1242; *Wight! cat. n.* 120.——Mountains and plains; from an altitude of 8000 feet to the level of the sea.

* 120. (2) D. *intermedia* (Drev. and Hayn.:) stemless: leaves all radical, obovate on long glabrous petioles: scapes ascending, and calyx glabrous: seed-coat not arilliform.—*DC. prod.* 1. *p.* 318; *Wight! cat. n.* 118.—D. longifolia, *Linn.; Wall.! L. n.* 3753; *Spr. syst.* 1. *p.* 955.

This was obtained from an Indian herbarium, but may have been sent from Europe: it is quite the same as the English plant.

121. (3) D. *Indica* (Linn.:) stem branched: leaves linear, on very short glabrous petioles, that are scarcely narrower than the limb: racemes and calyx puberulous: seed-coat not arilliform.—*DC. prod.* 1. *p.* 319; *Spr. syst.* 1. *p.* 955; *Roxb. fl. Ind.* 2. *p.* 113; *Wall.! L. n.* 1244; *Wight! cat. n.* 119.—*Rheed. Mal.* 10. *t.* 20; *Burm. Zeyl. t.* 94. *f.* 1.——Rather rare.

122. (4) D. *peltata* (Sm.:) stem erect, glabrous: leaves scattered, petioled, peltate, broadly lunate, with two longish horns pointing upwards: styles multifid, pencil-shaped: seeds oblong, testa not arilliform.—*Sm. in Rees' cycl.; La Bill. N. Holl. t.* 106. *f.* 2; *DC. prod.* 1. *p.* 319; *Spr. syst.* 2. *p.* 956; *Wight! cat. n.* 117.—D. lunata, *Ham.; DC. prod.* 1. *p.* 319; *Spr. syst.* 2. *p.* 956; *Wall.! L. n.* 1243.——Neelgherries.

The ciliæ on the sepals are either present or absent in the Indian specimens, and afford no character to separate them from the New Holland plant.

II. ALDROVANDA. *Linn.; Lam. ill. t.* 220.

Stamens 5. Styles 5, filiform: stigmas obtuse. Capsule globose, 5-valved. Seeds 10, large.—Floating plants. Leaves verticelled: petioles cuneate, ending in 4–5 long bristly horns; limb folded into a kind of crescent-shaped, winged bladder. Peduncles axillary, solitary, 1-flowered, about twice as long as the petioles.

123. (1) A. *vesiculosa* (Linn.:)—*DC. prod.* 1. *p.* 319; *Spr. syst.* 1. *p.* 956.—A. verticillata, *Roxb. fl. Ind.* 2. *p.* 112; *in E. I. C. mus. tab.* 1129.—*Pluk. t.* 41. *f.* 6.

We insert this on Plukenet's authority, all his Indian plants, we believe, without a particular locality, having been obtained from the Peninsula.

Sub-ord. 2. PARNASSIEÆ (*Arn.*) Sepals 5; æstivation imbricative. Petals 5, alternate with the sepals, hypogynous. Stamens hypogynous, 10–20, some of them often sterile: anthers bilocular, bursting longitudinally. Ovary solitary, unilocular: style none, and four sessile stigmas opposite the placentæ; or one with a lobed stigma. Fruit a capsule, 1-celled, 4–5-valved and loculicide; or indehiscent, and then the placenta is only at the base. Seeds numerous. Albumen 0. Embryo erect, or the radicle pointing to the hilum.—Bog plants. Leaves nearly all radical, without glandular hairs.

III. PARNASSIA. *Linn.; Gærtn. fr. t.* 60; *Lam. ill. t.* 216.

Stamens 10; 5 fertile; 5 sterile, opposite the claws of the petals. Stigmata 3–4, sessile. Capsule 4-valved.—Quite glabrous, herbaceous, bog

Digitized by Google

plants. Leaves radical, petioled. Scape with one sessile foliaceous bractea or rarely naked, dilated immediately under the flower.

124. (1) P. *mysorensis* (Heyne:) leaves cordate, somewhat reniform, lobes overlapping: bractea cordate embracing the scape: sepals broadly oval, a half longer than the incrassated part of the peduncle: petals oval-oblong, entire or slightly toothed on the margin, unguiculate, about 2½ times longer than the sepals: sterile stamens about half the length of the fertile, cleft upwards into 3 thickish oblong obtuse segments or lobes: stigmas 3.—*Wall.! L. n.* 3754.——Mysore; *Heyne.*

A small species with somewhat the habit of the arctic *P. Kotzebuei*, but with characters very different: it is perhaps too closely allied to *P. pusilla*, Wall. The sterile stamens resemble those of *P. fimbriata.*

125. (2) P. *Wightiana* (Wall.:) leaves broadly cordate-ovate or slightly reniform; sinus slightly rounded: bractea like the leaves, embracing the scape: petals obovate-oblong, their lower half having the margin cut into numerous slender linear simple or forked segments resembling a fringe; unguis very short, broad and cuneate: sterile stamens about as long as the fertile, cleft upwards into 3–5 stout horn-like segments that are glandular at the point.—*Wall.! L. n.* 3755; *Wight! cat. n.* 116.

Flowers large. Perhaps this and *P. ornata*, Wall.! L. n. 1247, may prove the same: in the latter, the petals have a much longer unguis which is nearly linear, and the lower part of their margin is cut into numerous pinnatifid segments, the divisions of which are long and capillary. Both are very closely allied to *P. fimbriata* of Banks, in which also the margin is cut and not ciliated.

ORDER XVII.—POLYGALEÆ. *Juss.*

Sepals 5, irregular, distinct; 3 exterior smaller, of which one is superior and two inferior; 2 interior (*alæ*) usually petaloid, lateral: æstivation imbricative. Petals hypogynous, unequal, usually 3, of which one (*carina*) is inferior and larger than the rest, while the others alternate with the upper and lateral sepals; sometimes there are 5, the *two additional*, between the lateral and lower sepals, being then generally minute, or very rarely large: carina sometimes entire, and then naked or crested; or sometimes 3-lobed, without a crest. Stamens hypogynous, 8, unequal, ascending, some or all of them united with the claws of the petals: anthers 1-celled, opening by a terminal pore, or very rarely by a longitudinal cleft. Ovarium free, compressed, formed of two united carpels, one anterior, the other posterior; usually 2-celled with the placentæ in the axis, or occasionally unilocular by the suppression of the posterior cell; rarely 1-celled with two opposite parietal placentæ: ovules solitary, or (very rarely) 2–6 in each carpel. Style simple, curved. Fruit loculicidal, or sometimes indehiscent. Seeds with a crustaceous outer integument. Albumen usually copious and fleshy, rarely none or reduced to a thin gelatinous plate. Embryo straight, or very slightly curved: radicle next the hilum.—Leaves without stipules. Flowers usually racemose. Pedicels with 3 bracteoles at their base.

Digitized by Google

I. POLYGALA. *Linn.; Lam. ill. t.* 598; *Gærtn. fr. t.* 62.

Sepals 5, persistent, the *alæ* large and petaloid. Petals 3; their claws all united with the staminiferous tube, the lower one (*carina*) keel-shaped, the two additional ones abortive. Stamens united into a tube at the base, which is cleft in front: anthers opening by a pore. Ovarium 2-celled; ovules solitary, pendulous from the apex of the cell. Capsule 2-locular, loculicide, compressed. Seeds pendulous from the apex of the cells, pubescent, with a carunculate arillus at the hilum: albumen abundant, fleshy.—Shrubs or herbaceous plants. Flowers arranged in terminal or axillary racemes.

126. (1) P. *telephioides* (Willd.:) stems herbaceous, diffuse, branched from the root, pubescent, terete, angled towards the extremity: leaves succulent, quite glabrous, oval-oblong, narrower at the base, obtuse, more or less mucronate, shortly petioled: racemes 4–5-flowered, nearly opposite to the leaves and scarcely one-half as long: bracteoles minute, at length deciduous: alæ foliaceous, oval, suddenly shortly acuminated and very sharp, glabrous, a little longer than the capsule: carina with a crest: capsule nearly orbicular, equal, emarginate, scarcely pubescent along the edge, not margined.—*α*; branches elongated, bearing here and there several simple branchlets; leaves from a half to three quarters of an inch long.—*Wight! cat. n.* 121.—P. telephioides, *Willd. sp.* 3. *p.* 876; *DC. prod.* 1. *p.* 332; *Spr. syst.* 3. *p.* 167.—*β*; branches short; leaves scarcely above two lines long.—*Wight! cat. n.* 127.—P. serpyllifolia, *Poir.; DC. prod.* 1. *p.* 326; *Spr. syst.* 3. *p.* 167.—P. arvensis, *Wall.! L. n.* 4172. *f.*

Flowers and fruit very small. Our var. *α* constitutes another of the varieties of Wallich's *P. arvensis*, but we are not sure which: it is very closely allied to *P. Chinensis*, but that is shrubby and has the racemes longer than the leaves. De Candolle, misquoting Willdenow, says the racemes are twice the *length* of the leaves.

127. (2) P. *arvensis* (Willd.:) stems herbaceous, branched from the base, procumbent, pubescent, terete below, angled upwards: leaves glabrous or slightly hairy, pubescent or ciliated on the margin, paler beneath, elliptic-oblong or obovate, narrowed towards the base, obtuse or retuse, scarcely mucronulate, petioled: racemes 4–8-flowered, nearly opposite to the leaves, and about half their length: bracteoles minute, persistent: alæ foliaceous, oblong, acuminated, scarcely longer than the capsule: carina cristate: capsule roundish, oblique, emarginate, ciliated, not margined.—*α*; leaves elliptic-oblong, glabrous on both sides; alæ glabrous.—*Wight! cat. n.* 130. *a.*—P. arvensis, *Willd. sp.* 3. *p.* 876; *DC. prod.* 1. *p.* 326; *Spr. syst.* 3. *p.* 167; *Wall.! L. n.* 4172. *c.*—P. prostrata, *Heyne mst.* (not *Willd.*)—P. procumbens *α*, *Roth. nov. sp. p.* 329; *DC. prod.* 1. *p.* 326; *Spr. syst.* 3. *p.* 166.—P. glaucoides, *Wight! in Wall. L. n.* 4171. *a.* (not *Linn.*)—P. crotalloides, *Roxb. in E. I. C. mus. tab.* 676.—*β*; leaves oblong, with a few soft hairs sprinkled on both sides and on the alæ.—*Wight! cat. n.* 130. *b.*—*γ*; leaves obovate, sprinkled with numerous soft hairs on both sides particularly on the nerve and margins, and on the alæ.—*Wight! cat. n.* 136.—P. grandiflora, *Wight! in Wall. L. n.* 4175.—*Rheed. Mal.* 9. *t.* 61.

There can be little doubt that Willdenow had accidentally reversed the names attached to the specimens of *P. arvensis* and *P. prostrata*, sent him by Klein and the missionaries, which has caused considerable confusion. This is, however, the *P. arvensis* of Koenig, and now also of Roxburgh's herbarium. Fruit much larger than in the last species.

128. (3) P. *Vahliana* (DC.:) stems herbaceous, branched from the base, procumbent, pubescent, terete below, angled upwards: leaves sprinkled on both sides with numerous soft hairs, oblong, attenuated downwards into the

Digitized by Google

petiole, obtuse, slightly mucronulate: racemes 3–5-flowered, very short, opposite to the leaves or lateral: bracteoles minute, persistent: alæ nearly membranaceous with a green middle nerve, elliptical, villous, scarcely longer than the capsule: carina cristate: capsule oval, emarginate, softly villous on the edge, not margined.—*DC. prod.* 1. *p.* 326; *Wight! cat. n.* 131.—P. tomentosa, *Herb. Mus.!*; *Heyne!*; *Vahl.*—P. serpyllifolia, *Wight! in Wall. L. n.* 4173. *a.* (not *Poir.*)

Fruit about half the size of that of *P. arvensis*.

129. (4) P. *Rothiana* (W. & A.:) stems herbaceous, branched from the base, rather erect?, pubescent, terete below, angled towards the top: leaves glabrous, ciliated, paler beneath, narrow oblong or linear, obtuse, mucronulate, very shortly petioled, upper ones distinctly 3–5-nerved, the lateral nerves close to the margin: racemes nearly capitate, 4–6-flowered, axillary or lateral, about 4–5 times shorter than the leaves: bracteoles minute, persistent: alæ somewhat foliaceous, ovate, acuminated, longer than the capsule: carina cristate: capsule roundish, oblique, emarginate, glabrous, ciliated, margined.—*Wight! cat. n.* 123.—P. procumbens β, *Roth. nov. sp. p.* 329; *DC. prod.* 1. *p.* 326.—P. angustifolia, *Heyne mss.* (not *Kunth.*)—P. glaucoides, *Wall.! L. n.* 4171. *c*; *Willd. sp.* 3. *p.* 896 (not *Linn.*)

130. (5) P. *Tranquebarica* (Mart.:) stems herbaceous, branched from the base, procumbent, pubescent, scarcely terete below, angled upwards: leaves glabrous, pubescent along the margin, paler beneath; upper ones oblong-linear, narrow; lower oblong or narrow obovate, obtuse, mucronulate, petioled: racemes short, 3–5-flowered, opposite to the leaves and about half as long: bracteoles minute, persistent: alæ with a membranaceous margin, ovate, acuminated, glabrous, ciliated below, the length of the capsule: carina cristate: capsule roundish, oblique, emarginate, glabrous, ciliated, not margined.—*DC. prod.* 1. *p.* 332; *Wight! cat. n.* 126, 135.—P. brachystachya, *DC. prod.* 1. *p.* 326.

This is one of the states referred by Dr Wallich to *P. arvensis*, but is, we think, quite distinct. Here the alæ are rather more oblique than in the other allied species, but not so much so as to form part of the character.

131. (6) P. *rosmarinifolia* (W. & A.:) stems suffrutescent or herbaceous, branched, pubescent, terete; branches long, twiggy, angled towards the top: leaves glabrous or slightly pubescent, particularly on the margin, paler beneath, oblong-linear, obtuse, mucronulate, shortly petioled: racemes short, 1–3-flowered, axillary or above the axils, not above half the length of the leaves: bracteoles minute, persistent: alæ nearly membranaceous, ovate, acute, scarcely longer than the capsule: carina cristate: capsule roundish, oblique, emarginate, glabrous, densely ciliated, not margined.—*Wight! cat. n.* 124, 133. *b* (a younger state), 140.—P. tranquebarica, *Wight! in Wall. L. n.* 4169.——Asewalendan Hills and Cunnewaddy near Dindygul.

If *P. theezans* of Linnæus be really a *Polygala*, this may be that species; but we incline to the idea that he took it up on Burmann's authority; and while the figure in Burm. Zeyl. (tab. 85) is probably *Ionidium enneaspermum*, De Candolle states that the description in Burm. Ind. appears to belong to a species of *Leptospermum*.*

132. (7) P. *triflora*, (Linn.:) annual: stems nearly simple, erect, terete, with a roughish pubescence: leaves glabrous, linear, mucronulate, shortly petioled: racemes 1–5- (usually about 3-) flowered, axillary or above the axils about half the length of the leaf: bracteoles minute persistent: alæ membranaceous with a middle green nerve, elliptical, scarcely longer than the capsule, pubescent, ciliated: carina cristate: capsule oblong, nearly even, scarcely margined, emarginate, pubescent, ciliated.—*DC. prod.* 1. *p.* 333; *Spr. syst.*

* Perhaps the same with *Fabricia bracteata*, Roxb. from which *Leptosp. amboinense*, DC. (Rumph. Amb. 2. t. 18.) does not seem to differ.

Digitized by Google

3. p. 171; *Wight! cat. n.* 133. *a.*—P. linearis, *Heyne! mss.*—P. linarifolia, *Roth. nov. sp. p.* 330 (not *Willd.*)

Notwithstanding that Linnæus says that the flowers are not cristate, we believe this is his plant. *P. thesioides*, Wall.! L. n. 4170. *b, c, d,* (but not *a* nor *e*) approaches very closely to this, but has linear-oblong obtuse and more or less pubescent leaves.

133. (8) P. *Wightiana* (Wall.:) annual, quite glabrous, and slightly glaucous: stems twiggy, branched, diffuse, terete: leaves linear, tapering downwards, acute with a long mucro: racemes opposite to the leaves, many-flowered, at length elongated and 3–4 times longer than the leaves: bracteoles minute persistent: alæ oblong, acuminated, somewhat foliaceous, a little longer than the capsule: carina cristate: capsule oblong, nearly even, scarcely margined, glabrous, not ciliated, emarginate.—*Wall.! L. n.* 4190; *Wight! cat. n.* 134.——Dindygul.

Leaves exceedingly like those of a *Thesium*.

134. (9) P. *elongata* (Klein:) annual: stems branched from the base, pubescent, terete below, angled upwards; lateral branches procumbent: leaves oblong-linear, tapering downwards, obtuse, mucronulate, glabrous, sprinkled with a few hairs on the midrib below, and on the margins: racemes above the axils, or opposite to the leaves, many-flowered, at length elongated and 2–4 times longer than the leaves: bracteoles minute, persistent: alæ oblong, acute, somewhat foliaceous, a little longer than the capsule: carina cristate: capsule roundish, oblique, slightly margined, glabrous, not ciliated, emarginate.—*Klein! in Willd. sp.* 3. *p.* 879; *DC. prod.* 1. *p.* 332; *Spr. syst.* 3. *p.* 167; *Wall.! L. n.* 4168; *Wight! cat. n.* 137.——Mysore.

135. (10) P. *ciliata* (Linn.:) annual: stems branched chiefly from the base, diffuse, terete below, angled upwards, with horizontal rigid hairs: leaves oblong, tapering downwards, obtuse, mucronate, glabrous, ciliated on their lower half with rigid hairs: racemes horizontally and rigidly hairy, at length elongated and twice as long as the leaves, many-flowered, usually a little above the axils of the leaves: bracteoles minute, persistent: alæ membranous-margined, glabrous, ovate, acute, slightly longer than the capsule: carina cristate: capsule roundish, slightly oblique, not margined, glabrous, rigidly-ciliated, emarginate.—P. ramosa, *Wight! in Wall. L. n.* 4177.—*α*; larger; leaves obovate-oblong.—*Wight! cat. n.* 122.—P. ciliata, *Linn.; Willd. sp.* 3. *p.* 896; *Spr. sp.* 3. *p.* 171.—Salomonia? ciliata, *DC. prod.* 1. *p.* 334.—*β*; smaller; leaves linear-oblong.—*Wight! cat. n.* 125.—P. prostrata, *Willd.; DC. prod.* 1. *p.* 333; *Spr. syst.* 3. *p.* 171.—P. arvensis, *Roxb. in E. I. C. mus. tab.* 675.

The hairs in this species arise from tubercles, which equally exist on the edge of the capsule; but this last ought not to be called toothed. Willdenow and Linnæus have neither of them observed the small but perfect crest to the carina.

136. (11) P. *Heyneana* (Wall.:) suffrutescent: branches procumbent, pubescent, terete below, angled upwards: leaves linear-oblong, obtuse, mucronate, slightly pubescent, particularly beneath, somewhat reticulated with prominent veins: racemes lax, 5–8-flowered, twice the length of the leaves, above the axils or opposite to the leaves: bracteoles minute, lower ones soon deciduous: alæ foliaceous, ovate acute, glabrous, about the length of the capsule: carina cristate: capsule roundish, nearly equal, margined and there pubescent, otherwise glabrous, emarginate.—*Wall. L. n.* 4184; *Wight! cat. n.* 128, 129, 132.—P. venosa, *Heyne.*——Neelgherries.

We have not seen Heyne's or Wallich's plant, but have no doubt about the reference. A specimen was formerly sent to Dr Wallich by Dr Wight, and, if taken up by him, is probably one of the states of his *P. arvensis*.

137. (12) P. *Javana* (DC.:) suffrutescent, all over softly villous, or more or less tomentose: branches diffuse, terete below, angled upwards: leaves

Digitized by Google

obovate or oblong, cuneate at the base, shortly petioled, obtuse or retuse, mucronate: racemes opposite to the leaves, many-flowered, at length nearly twice as long as the leaves: bracteoles small, persistent: alæ ovate-orbicular, membranaceous, mucronate, softly pubescent, about a half longer and broader than the capsule: carina cristate: capsule orbicular, nearly equal, softly pubescent especially on the edge, slightly margined, emarginate.—*DC. prod.* 1. *p.* 327; *Spr. syst.* 3. *p.* 164; *Wight! cat. n.* 139.—P. Ceylana, *Heyne in Wall.! L. n.* 4183.

An elegant species, resembling some of those from the Cape in its large flowers and alæ.

138. (13) P. *arillata* (Ham.:) shrubby, erect; branches pubescent: leaves oblong, acuminated, on longish petioles, puberulous beneath: racemes lax, many-flowered, terminal or opposite to the leaves and about as long, drooping: bracteoles caducous: alæ obovate, obtuse, tapering downwards, glabrous: carina cristate: capsule reniform, retuse, coriaceous: seeds globose, smaller than the large carunculus.—*Ham. in Don. prod. fl. Nep. p.* 199; *Spr. syst. supp. p.* 265; *Wall.! L. n.* 4191; *pl. Asiat. rar. t.* 100; *Wight! cat. n.* 138.——Neelgherries.

†139. (14) P. *persicariæfolia* (DC.?)—*Wall. L. n.* 4185. *c.*

II. XANTHOPHYLLUM. *Roxb.*

Sepals 5, deciduous, the two interior a little larger and more petaloid than the others. Petals 5, distinct: carina cymbiform, the two additional ones as large as the two upper. Stamens 8: two lower filaments united with the claw of the carina; two distinct inserted opposite to the inner sepals; the others attached one to each of the claws of the upper and lateral petals. Anthers opening by a pore. Ovarium shortly stalked, 1-celled, with two opposite prominent lateral placentæ, each bearing 2–6 pendulous ovules. Fruit between coriaceous and fleshy, indehiscent, globose, 1-celled. Seed without a carunculus, solitary, attached laterally. Albumen none. Embryo transverse: cotyledons semiglobose, fleshy.—Trees. Leaves coriaceous, shining. Racemes axillary, supra-axillary, or terminal.

140. (1) X. *flavescens* (Roxb.:) leaves elliptic-oblong, with a short blunt acumination, under side with two pores near the base: racemes axillary and terminal: ovules 8–12.—*Roxb. fl. Ind.* 2. *p.* 222; *Spr. syst.* 2. *p.* 219; *Wall.! L. n.* 4198. *c*; *Wight! cat. n.* 60.—*Rheed. Mal.* 4. *t.* 23.——Malabar coast.

Jackia of Blume appears identical with this genus, and perhaps *J. excelsa*, Bl., is the same as the present species.

ORDER XVIII.—TAMARISCINEÆ. *Desv.*

Calyx 4–5-partite, persistent: æstivation imbricative. Petals 4–5, inserted on the receptacle, marcescent: æstivation imbricative. Stamens equal to the petals in number, or twice as many, inserted on the margin of the torus, distinct or monodelphous. Ovarium 1-celled: style 3 or none: stigmas 3, distinct or united. Capsule 3-valved, 1-celled, loculicide, polyspermous. Placentæ sometimes only at the base of the capsule. Seeds erect or ascending, comose. Albumen 0. Embryo straight, with the radicle next the hilum.—Shrubs or herbs. Leaves alternate, like small scales.

Digitized by Google

I. TAMARIX. *Linn.; Lam. ill. t.* 213. *f.* 1.

Sepals 5, distinct. Petals 4–5. Stamens 4–10, equal, inserted each on and connecting two of the teeth of the torus, distinct, without any intermediate gland or membrane. Torus fleshy, scutelliform, supporting the ovarium, with twice as many teeth on the margin as there are stamens. Styles 2–4, usually 3. Seeds not beaked, with a simple pappus-like coma at their extremity.—Flower-bearing branchlets, usually arranged in panicles.

141. (1) T. *gallica* (Linn.:) young branches glabrous: leaves amplexicaul, glabrous: stamens 5: torus 10-toothed: styles 3, longish: capsules attenuated (not turgid).—T. gallica *var.* Indica, *Ehrenb.; Wight! cat. n.* 950.—T. Indica, *Roxb.* and *Willd.; DC. prod.* 3. *p.* 96; *Spr. syst.* 1. *p.* 943; *Roxb. fl. Ind.* 2. *p.* 100 (exclud. syn. Vahl); *Wall.! L. n.* 1240.—T. epacroides, *Sm.*—T. articulata, *Wall.! L. n.* 3756. *a, d.*

*142. (2) T. *dioica* (Roxb.:) young branches glabrous: leaves sheathing, glabrous: flower-bearing branchlets about as long as the dense terminal spikes: flowers dicœcious: stamens 5: styles 2–3, elongated beyond the corolla.—*Roxb. hort. Bengh. p.* 22; *fl. Ind.* 2. *p.* 101; *Roth. nov. sp. p.* 185; *Wall.! L. n.* 1241.—T. articulata, *Wall.! L. n.* 3756. *b* (male).

Allied to *T. articulata*, Vahl, but that species appears to be bisexual: also to *T. Pharos*, Ham., which is also dicœcious, but has lax spikes nearly sessile on the branches almost without the intervention of a leafy branchlet. We insert this, because we have reason to believe that Wall. L. n. 3756. *c.* belongs to it. Dr Wight's specimen sent to Dr Wallich was obtained from the Madras herbarium, and corresponded consequently to that described by Roth.

II. TRICHAURUS. *Arn. mss.*

Sepals 5. Petals 5, slightly unequal. Stamens 10, the alternate ones shorter, inserted between and alternating with the teeth of the torus: filaments distinct, not connected by a membrane. Torus fleshy, cup-shaped, surrounding the base of the ovarium, with as many teeth on the margin as stamens. Styles 3. Seeds rostrate: beak straight, feathered with long spreading hairs.—Young leaves sheathing. Corolla and capsule the largest of this natural order.

This genus is mostly allied to *Myricaria* (*Tamarix*, Lam. ill. t. 213. f. 2.), but differs from it by the distinct styles and stigmas, and by the torus being only expanded into a tooth, instead of a connecting membrane, between the stamens. From *Tamarix* the beaked seed and other characters will readily distinguish it.

143. (1) T. *ericoides* (Arn. mss.)—*Wight! cat. n.* 951.—Tamarix ericoides, *Rottl. and Willd.; Roth. nov. sp. p.* 184; *DC. prod.* 3. *p.* 97; *Spr. syst.* 1. *p.* 943; *Wall.! L. n.* 1239.—T. tenacissima, *Ham. in Wall.! L. n.* 3757.—T. mucronata, *Smith.*—Myricaria vaginata, *Desv.; DC. prod.* 3. *p.* 98.—Palaar.

ORDER XIX.—ELATINEÆ. *Camb.*

Sepals 3–5, distinct, or slightly connate at the base. Petals hypogynous, alternate with the sepals. Stamens hypogynous, equal in number to, or twice as many as, the petals. Ovarium 3–5-celled: styles 3–5: stigmas capitate. Placentæ in the axis. Capsule 3–5-celled, 3–5 valved, loculicide. Seeds numerous. Albumen 0. Embryo cylindrical: radical next the hilum.—Annual marsh plants. Leaves opposite, with small inconspicuous stipules.

Digitized by Google

I. ELATINE. *Linn.; Lam. ill. t.* 320; *Gærtn. fr.* 2. *t.* 112. *f.* 2.

Styles distinct at the base, very short, or none.—*The rest as in the character of the order.*

144. (1) E. (Crypta) *ambigua* (Wight :) stems diffuse, rooting: leaves opposite, oblong, attenuated towards the base: flowers pedicellate, axillary, opposite or alternate, with three sepals, petals, and stamens: stigmas sessile. —*Wight! in Hook. Bot. Misc. v.* 2. *p.* 103. *supp. tab.* 5; *cat. n.* 153.

145. (2) E. (Bergia) *verticillata* (W. & A.:) glabrous: stems branched, rooting from the lower joints: leaves opposite, lanceolate, attenuated below into a longish petiole, serrated especially towards the point: flowers densely capitate, sessile, axillary: sepals and petals 5: stamens 10: styles short.—*Wight! cat. n.* 154.—E. luxurians, *Delile.*—Bergia verticillata, *Willd.; DC. prod.* 1. *p.* 390; *Spr. syst.* 2. *p.* 422; *Roxb. fl. Ind.* 2. *p.* 456; *Wall.! L. n.* 654. —B. aquatica, *Roxb. Cor.* 2. *t.* 142.—B. capensis, *Linn.—Rheed. Mal.* 9. *t.* 78; *Pluk. t.* 132. *f.* 6.

We can point out no character to separate *Bergia* from *Elatine*, and indeed it nearly corresponds with Mr Arnott's first section (Ed. Journ. Nat. Geogr. Sc. 1. p. 430.)

146. (3) E. (Bergia) *ammannoides* (W. & A.:) stems branched, erect, or with the lower branches procumbent: leaves oblong-lanceolate, acute, attenuated towards the base, sharply serrated: flowers pedicellate, several together in the axils of the leaves: sepals, petals, and stamens, equal in number (3–5): styles short.—*Wight! cat. n.* 155.—Bergia ammannoides, *Roxb. hort. Bengh. p.* 34; *fl. Ind.* 2. *p.* 457; *Roth. nov. sp. p.* 219; *DC. prod.* 1. *p.* 390; *Spr. syst.* 2. *p.* 423; *Wight! in Hook. Bot. Misc.* 3. *p.* 93. *supp. tab.* 28; *Wall.! L. n.* 656.—B. pentandra, *Camb.*—Lechea verticillata, *Willd.; DC. prod.* 1. *p.* 286; *Spr. syst.* 1. *p.* 363.

Stems usually rough, with short capitate hairs; but sometimes glabrous.

147. (4) E. (Bergia) *æstivosa* (W. & A.:) glabrous: stems much branched: leaves opposite, obovate, or oblong, attenuated towards the base; those on the flower-bearing branches almost linear: flowers pedicellate, axillary, opposite, solitary: sepals and petals 5: stamens 10: styles short.—*Wight! cat. n.* 156.—Spergula æstivosa, *Koen.; Wall.! L. n.* 6963.

ORDER XX.—CARYOPHYLLACEÆ. *Juss.*

Sub.-ord. 1. CARYOPHYLLEÆ (*Arn.*) Sepals 4–5, distinct or cohering in a tube, persistent. Petals 4–5, unguiculate, sometimes wanting. Stamens usually double the number of the petals, or, if equal, alternate with them, hypogynous or rarely somewhat perigynous: filaments subulate, sometimes cohering: anthers erect, bilocular, opening longitudinally. Ovarium 1, of 2–5 united carpels, often stipitate. Stigmas 2–5, sessile, filiform; papillose on their inner surface. Capsule 2–5 valved, 1-celled, or imperfectly (rarely completely) 2–5 celled, opening usually by twice as many teeth as stigmas, sometimes by valves. Placenta in the axis of the fruit. Seeds indefinite, or rarely definite, campulitropous. Albumen mealy, round which the embryo is curved.—Leaves opposite and entire, often connate at the base, without scarious stipules; rarely alternate, with an auricle at each side of the petiole (the remains of the opposite leaf.)

Digitized by Google

We can point out almost no character except the scarious stipules to separate this order from the *Illecebreæ*; and if the species of *Arenaria* and *Spergula*, with such stipules, be not removed, even that character fails. *Caryophylleæ* have usually large petals and hypogynous stamens; the other generally small or abortive petals, and more or less perigynous stamens; but there are many exceptions. We shall omit here *Dianthus Chinensis*, Wall. L. n. 656, as Roxburgh expressly states it to be cultivated.

I. GYPSOPHILA. *Linn.*

Calyx tubular, 5-toothed, angled, naked at the base, persistent. Petals 5. Stamens 10. Styles 2. Capsule 1-celled, many-seeded.—Stipules none.

148. (1) G. *vaccaria* (Smith:) annual, glabrous: leaves ovate and oblong-lanceolate, sessile, connate at the base: flowers bisexual, panicled: calyx smooth, pyramidal: petals with long claws, erose at the apex.—*Spr. syst.* 2. *p.* 371; *Wight! cat. n.* 143.—Saponaria vaccaria, *Linn.*; *DC. prod.* 1. *p.* 365. *Wall.! L. n.* 1503.—S. perfoliata, *Roxb. fl. Ind.* 2. *p.* 445; *DC. prod.* 1; *p.* 365.

II. SILENE. *Linn.*; *Lam. ill. t.* 377; *Gærtn. fr. t.* 130. *f.* 8.

Calyx tubular, not angled, 5-toothed, naked. Petals 5, with long claws; claw often crowned with scales at the top; limb bifid. Stamens 10. Styles 3. Capsule 3-celled at the base, opening at the top by 6 teeth.—Stipules none.

149. (1) S. *intrusa* (W. & A.:) viscidly pubescent: stems elongated, dichotomously branched: leaves (upper ones) broadly lanceolate: flowers (large) panicled: pedicels alternate, 1-flowered, without bracteoles, much longer than the subtending floral leaf: calyx (in flower) long club-shaped, with longish teeth, truncate and slightly hollow at the insertion of the pedicel, with 10 connected ribs: petals deeply bifid (reddish): fruit ovoid, 1¼ times broader, and 2½ longer than the stalk-like torus.—*Wight! cat. n.* 146.—S. indica, var. *Wall.! L. n.* 624. *e.*——Neelgherries.

Very distinct from *S. indica*, Roxb. (Wall.! L. n. 624. *a.*), but not so much so from *S. noctiflora*, Linn.; but this last has not the calyx truncate, and the pedicels are opposite: may local circumstances cause this difference?

III. STELLARIA. *Linn.*; *Lam. ill. t.* 378; *Gærtn. fr. t.* 130. *f.* 3.

Calyx 5-parted. Petals 5, bifid. Stamens 10 (or by abortion 3–8). Styles 3. Capsule 1-celled, opening at the apex by 6 valves (or rather 3 valves, each divided into 2), many-seeded. Stipules none.

150. (1) S. *media* (Sm.:) stems procumbent, with an alternate line of hairs on one side: lower leaves ovate, upper ones lanceolate: petals deeply divided: stamens 5–10: capsules deeply divided, scarcely longer than the calyx.—*DC. prod.* 1. *p.* 396; *Spr. syst.* 2. *p.* 392; *Wight! cat. n.* 145 (a large state), 147; *Wall.! L. n.* 631.—S. monogyna, *Don.*——Neelgherries.

Always readily distinguished by the line of hairs on the stem.

*151. (2) S. *aquatica* (Poll.:) stems decumbent, glabrous: leaves ovate-lanceolate, with a callous tip: flowers in dichotomous panicles: sepals combined at the base: petals bipartite, shorter than the calyx, and, as well as the stamens, slightly perigynous.—*DC. prod.* 1. *p.* 398; *Wall. L. n.* 635. *b.* (*p.* 248). —S. uliginosa, *Murr.*; *Sm.*; *Spr. syst.* 2. *p.* 393.—Larbrea aquatica, *St Hil.*; *DC. prod.* 1. *p.* 395. (exclud. spec. char. and synon.)——Neelgherries.

We almost suspect that the plant from Dr Wight's herbarium, referred here by Dr Wallich, belongs to the last species.

IV. CERASTIUM. *Linn.*; *Lam. ill. t.* 392; *Gærtn. fr. t.* 130. *f.* 6.

Sepals 5. Petals 5, bifid. Styles 5. Capsule 1-celled, cylindrical or glo-

Digitized by Google

bose, bursting at the apex with 10, or rarely 5, teeth (or 5 valves, each usually divided).—Stipules none.

152. (1) C. *Indicum* (W. & A.:) stems, leaves, and calyx, covered with a roughish viscid pubescence: stems flaccid, angled: leaves ovate or oblong, lanceolate, with a short mucroniform attenuation: flowers much shorter than the pedicels, in a small compact somewhat dichotomous panicle: petals scarcely longer than the oblong-acutish sepals: capsules ovoid, scarcely so long as the calyx; teeth 10, rolled backwards, their margins flat.—*Wight! cat. n.* 149.

153. (2) C. *vulgatum* (Linn.:) hairy, nearly erect; upper parts viscid: leaves ovate, obtuse: bracteas herbaceous: flowers longer than the pedicels, in a small somewhat capitate panicle: petals as long as the oblong calyx: capsule cylindrical, curved upwards; teeth 10, straight, their margins rolled backwards.—*DC. prod.* 1. *p.* 415; *Spr. syst.* 2. *p.* 419; *Wight! cat. n.* 150.

V. ARENARIA. *Linn.; Lam. ill. t.* 378; *Gærtn. fr. t.* 130. *f.* 9.

Sepals 5. Petals 5, entire. Stamens 10 (or fewer by abortion). Styles 2, 3, or 4. Capsule opening by 3, usually bipartite, valves. Seeds numerous, roundish, small.—Stipules none.

154. (1) A. *Neelgherrense* (W. & A.:) stems elongated, much branched, procumbent, with an alternate line of hairs on one side: leaves distant, obovate, mucronulate, glabrous, with minute whitish points, 1-nerved; margins thickened, nerve-like, ciliated towards the petiole: flowers axillary, or in terminal sub-dichotomous panicles: pedicels viscidly pubescent all round, longish, slender: sepals oblong, acute, with 1 dorsal hairy nerve; margin membranaceous: petals longer than the calyx: styles usually 3 (sometimes 2 or 4): capsules ovate, nearly the length of the calyx.—*Wight! cat. n.* 144, 148.——Neelgherries.

Formerly sent to Dr Wallich, by Dr Wight, as probably a *Cerastium*, but without flower: it does not seem to be noticed in his List.

VI. MOLLUGO. *Linn.; Gærtn. fr. t.* 130. *f.* 8, 4.

Calyx 5, parted. Petals usually none; rarely 5, minute, bifid, and alternating with the sepals. Stamens 5, opposite to the sepals, or fewer by abortion, sometimes 10. Styles 3. Capsule 3-valved, 3-celled, loculicidal, many-seeded.—Leaves actually opposite, and without stipules; but by abortion apparently alternate, with 2 stipules; containing in their axils several leaves surrounding the base of the young branch, and forming radical or lateral tufts opposite to the peduncles: hence they are usually said to be verticillate.

In all the Caryophylleæ, the two opposite petioles are united together into a little sheath, more or less conspicuous, round the branch; in this genus one of the leaves is abortive, but its petiole is split-up, leaving a portion, like a stipule, attached on each side to the base of the petiole of the perfect leaf. Perhaps for the same reason, *Telephium* and *Corrigiola* might be removed to this order. However anomalous the assertion may appear, the leaves, we conceive, are, philosophically speaking, all radical, with leafless scapes, each laterally proliferous about its middle.

155. (1) M. *nudicaulis* (Linn.:) leaves radical, numerous and crowded, obovate or oblong, obtuse, attenuated into a petiole: scapes trichotomously panicled, decumbent, leafless: stamens usually 3: petals none: seeds roughish, with very minute tubercles.—*DC. prod.* 1. *p.* 391; *Wall.! L. n.* 648; *Wight! cat. n.* 163.—M. bellidifolia, *Ser. in DC. prod.* 1. *p.* 391.—Pharnaceum spathulatum, *Sw.; Spr. syst.* 1. *p.* 948.—*Burm. Zeyl. t.* 8. *f.* 2.

Digitized by Google

156. (2) M. *pentaphylla* (Linn.:) glabrous: stems decumbent, leafy, angled: leaves slightly glaucous, firm, obovate, obtuse, mucronulate, tapering at the base: panicles elongated, many-flowered: stamens usually 3: petals none: seeds rough, with minute numerous tubercles.—*DC. prod.* 1. *p.* 391; *Roxb. fl. Ind.* 1. *p.* 359; *Wall.! L. n.* 650; *Wight! cat. n.* 161.—Pharnaceum pentaphyllum, *Spr. syst.* 1. *p.* 949.—*Burm. Zeyl. t.* 8. *f.* 1.

157. (3) M. *triphylla* (Lour.:) glabrous: stems diffuse, leafy, angled: leaves green, thinnish, obovate or oblong, mucronulate, tapering at the base: panicles elongated, many-flowered: stamens 3–5: petals none: seeds rough, with minute tubercles.—*DC. prod.* 1. *p.* 392; *Roxb. fl. Ind.* 1. *p.* 360; *Wall.! L. n.* 651; *Wight! cat. n.* 159, 160.—M. Linkii, *Ser. in DC. prod.* 1. *p.* 392.—M. paniculata, *Burm.*—M. radiata, *Ruiz. and Pav.*—Pharnaceum triphyllum, *Spr. syst.* 1. *p.* 949.—*Burm. Zeyl. t.* 6. *f.* 2; *Pluk. t.* 118. *f.* 1; *Rheed. Mal.* 10. *t.* 26.

This is possibly not a distinct species from the last, and tends to combine with them the following one also.

158. (4) M. *stricta* (Linn.:) glabrous: stems straightish, diffuse at the base, then erect, angled: leaves linear-lanceolate pointed, thin, and green. panicles elongated, many-flowered: stamens 3: petals none: seeds with minute tubercles.—*DC. prod.* 1. *p.* 391; *Burm. Ind. t.* 5. *f.* 3; *Wall.! L. n.* 649; *Wight! cat. n.* 151.—Pharnaceum strictum, *Spr. syst.* 1. *p.* 949.—*Pluk. t.* 257. *f.* 2.

159. (5) M. *cerviana* (Ser.:) glabrous: stems straightish, ascending, terete: leaves linear, very narrow, bluntish, glaucous: peduncles elongated, bearing 3 umbellate flowers: stamens usually 5: petals none: seeds without dots or tubercles.—*DC. prod.* 1. *p.* 392; *Wall.! L. n.* 7128; *Wight! cat. n.* 162.—Pharnaceum cerviana, *Linn.; Lam. ill. t.* 214. *f.* 2; *Spr. syst.* 1. *p.* 948.—*Pluk. t.* 128. *f.* 3; *t.* 332. *f.* 9. *pl.* 11.

160. (6) M. *disticha* (Ser.:) glandularly-pubescent: stems diffuse, angled: leaves nearly linear, thickish: panicles rigid, slightly branched, sometimes mere racemes: stamens usually 5: petals none: seeds inconspicuously marked with depressed dots.—*DC. prod.* 1. *p.* 392; *Wall.! L. n.* 652; *Wight! cat. n.* 158. *a, b* (a monstrosity).—Pharnaceum distichum, *Linn.; Spr. syst.* 1. *p.* 949.—*Pluk. t.* 130. *f.* 6; *t.* 332. *f.* 9. *pl.* 4.——Palaar.

Perhaps Pluk. t. 332. fol. 9. pl. 3. may be also this species, but the figure is not very characteristic.

161. (7) M. *spergula* (Linn.:) stems very straggling and branched: leaves more or less succulent, oblong or obovate, mucronate, attenuated towards their base: pedicels 1-flowered, several together, forming a simple sessile umbel: stamens 3–5, or 10: petals narrow, cleft to the middle, or none: seeds rough with numerous minute tubercles—*DC. prod.* 1. *p.* 391; *Burm. Ind. t.* 5. *f.* 4; *Wall.! L. n.* 653; *Wight! cat. n.* 157.—M. verticillata, *Roxb. fl. Ind.* 1. *p.* 360 (not Linn.)—M. erecta, *Burm. Ind. p.* 32.—M. parviflora, *DC. prod.* 1. *p.* 391.—Pharnaceum mollugo, *Linn.; Spr. syst.* 1. *p.* 948; *Roxb. fl. Ind.* 2. *p.* 102.—P. parviflorum, *Roth.; Spr. syst.* 1. *p.* 948.—*Rheed. mal.* 10. *t.* 24; *Burm. Zeyl. t.* 7; *Pluk. t.* 130. *f.* 5.

The tuberculated seed alone will distinguish this from the American *M. verticillata*. All the specimens we have seen from the continent of India have 5 or 10 stamens, and 5 forked petals, (that in Hamilton's herbarium marked without petals, and consequently part of Dr Wallich's L. n. 653. *f*, actually having them); but in Mr Arnott's herbarium, there is a specimen from Java, not otherwise distinct, with only 3 stamens and no petals.

Digitized by Google

ORDER XXI.—MALVACEÆ. *Juss.*

Sepals 4, rarely 3–5, more or less cohering at the base, often having an external calyx or involucel: æstivation valvate. Petals hypogynous, equal in number to the sepals: æstivation twisted. Stamens hypogynous, monadelphous, indefinite or rarely as few as the petals. Anthers 1-celled, reniform, bursting transversely. Ovarium formed by the union of several carpels round a common axis, either distinct or cohering: styles as many as the carpels, united or free, entire or cleft: stigmas as many, or twice as many, as the carpels. Fruit capsular or baccate: carpels 1- or many-seeded, sometimes closely united, sometimes separate or separable. Dehiscence loculicidal or septicidal. Albumen 0, or in very small quantity. Embryo curved: cotyledons twisted and doubled up.—Leaves alternate, stipulate. Hairs stellate.

I. MALVA. *Linn.; Lam. ill. t.* 582; *Gærtn. fr. t.* 136.

Calyx 5-cleft, persistent, surrounded by an involucel of usually 3, rarely 1–2 or 5–6, more or less oblong or setaceous bracteoles. Ovarium with many cells, each with one ovule. Styles as many as the cells. Carpels several (rarely only 5), capsular, indehiscent, 1-seeded, circularly arranged round the axis. Radicle inferior.

In the following, as well as in all the species of the genus, except two from the Mauritius, the carpels are numerous, and placed so closely side by side, as, before maturity, to resemble a flattish disk.

162. (1) M. *Mauritiana* (Linn.:) annual: stems erect, herbaceous: leaves cordate, with 5 obtuse lobes: petioles nearly glabrous, or tomentose on their upper side: pedicels several together, axillary, 1-flowered: bracteoles 3, ovate, obtuse: corolla (purple) much longer than the calyx: carpels wrinkled on the back.—*DC.! prod.* 1. *p.* 432; *Cav. diss.* 2. *t.* 25. *f.* 2; *Wall. L. n.* 1877; *Wight! cat. n.* 166.—M. Mauritanica, *Spr. syst.* 3. *p.* 90.

163. (2) M. *rotundifolia* (Linn.:) stems herbaceous, patulous: leaves cordate, roundish, shortly and obtusely lobed, crenated: petioles elongated, nearly glabrous, or hairy, or with only a line of hairs on their upper side: pedicels several together, unequal, the longest scarcely so long as the distance between the leaves, axillary, 1-flowered, bent downwards when in fruit: bracteoles 3, oblong-linear: corolla (pale purple): carpels prominently wrinkled and reticulated on the back.—*DC. prod.* 1. *p.* 433; *Spr. syst.* 3. *p.* 90; *Cav. diss. t.* 26. *f.* 3.—α; flowers several times longer than the calyx: bracteoles narrow oblong, slightly obtuse.—*Wall.! L. n.* 1884. *e*; *Wight! cat. n.* 165. *a*.—β; flowers scarcely longer than the calyx: bracteoles linear, acute.—*Wall.! L. n.* 1884. *f.*; *Wight. cat. n.* 165. *b*.—α from Mysore; *Heyne*.—β from Madura.

M. rosea, Roxb. in E. I. C. mus. tab. 670; and Herb. Smith, appears to be this species.

II. ALTHÆA. *Linn.; Lam. ill. t.* 581; *Gærtn. fr. t.* 136.

Calyx surrounded by a 6–9-cleft involucel. Carpels numerous, capsular, closely and circularly arranged round the axis.

164. (1) A. *Coromandeliana* (Cav.:) stem erect, hispid or tomentose: petioles tomentose: leaves tomentose, roundish, reniform or cordate or truncate at the base, slightly and obtusely lobed; upper ones tomentose: flowers

Digitized by Google

solitary, axillary, on short pedicels; upper ones in a spiciform raceme: involucel usually 6-cleft: petals obcordate, their claws villous: carpels surrounded by a membranaceous furrowed margin.—*DC. prod.* 1. *p.* 437; *Spr. syst.* 3. *p.* 107; *Wight! cat. n.* 167.—A. flexuosa, *Sims, Bot. Mag. t.* 892; *DC. prod.* 1. *p.* 437; *Spr. syst.* 3. *p.* 108.—A. Chinensis, *Wall.! L. n.* 2689. *b.* —*Pluk. t.* 259. *f.* 2?

Perhaps *A. Coromandeliana*, and *A. Chinensis*, are mere varieties of *A. rosea*. We have reason however to believe, that ours is certainly the plant of Sims, which was sent from Madras by Lady Gwillim, under the name of the Seringapatam Hollyhock.

III. URENA. *Linn.; Lam. ill. t.* 583; *Gærtn. fr. t.* 135.

Calyx persistent, surrounded by a 5- (or rarely 10-) cleft persistent involucel. Style 1, 10-cleft at the apex. Carpels 5, (or by abortion 4), capsular, connivent, indehiscent, 1-seeded, usually echinated externally with numerous prickles having multifid reflexed points (glochidiate). Radicle inferior.—Leaves usually bearing beneath glandular pores on one or more of the nerves near their base.

The number of glands, the shape of the leaves, and their hairiness, vary so much in specimens of the same species, that all those generally known might with great propriety be referred to two,—the Linnæan *U. lobata*, and *sinuata*. At all events, no reliance ought to be placed on the characters usually given.

165. (1) U. *lobata* (Linn.:) herbaceous: leaves roundish, with 3 or more short sometimes obsolete acute or obtuse lobes, more or less velvety, 5–7-nerved, with one or sometimes three glands: segments of the involucel 5, oblong-lanceolate, equal to the expanded calyx: carpels densely pubescent, echinate.—*DC. prod.* 1. *p.* 441; *Spr. syst.* 3. *p.* 96; *Wall.! L. n.* 1928; *Wight! cat. n.* 168 (densely villous) *and* 170 (densely pubescent).—*Dill. Elth. t.* 319. *f.* 412; *Rumph. Amb.* 6. *t.* 25. *f.* 2. A.

*166. (2) U. *scabriuscula* (DC.:) herbaceous: leaves roundish, with 3 or more short sometimes obsolete acute or obtuse lobes, harshly pubescent on both sides; 5–7-nerved, with 1 or 3 glands beneath: segments of the involucel 5, linear, acuminated, longer than the expanded calyx: carpels pubescent, echinated.—*DC. prod.* 1. *p.* 441; *Spr. syst.* 3. *p.* 96; *Wight! cat. n.* 169.—U. cana? *Wall.! L. n.* 1930. *b.*

The specimens before us were from the Madras herbarium, under the name of *U. lobata*, and with the remark that they were the produce of seeds obtained from the Isle of France. Perhaps it is not distinct from the last species.

†167. (3) U. *repanda* (Sm.:) herbaceous: stem downy: leaves broadly ovate, waved, serrated, scarcely lobed, longer than the petioles; upper side even, rough with stellate hairs; under with a solitary gland, strongly reticulated with copious veins, paler but scarcely more soft or downy: segments of the involucel subulate, the tube at length strongly ribbed: carpels unarmed. —*DC. prod.* 1. *p.* 441.—Pavonia repanda, *Spr. syst.* 3. *p.* 98.—Coromandel; *Roxburgh.*

Of this, or of the genus to which it belongs, we know nothing. The above is entirely taken from Smith (in Rees' Cyclopedia, v. 37), to whom Roxburgh sent specimens: it is not in Wallich's List.

168. (4) U. *sinuata* (Linn.:) perennial, shrubby?: leaves divided into 5 or 3 lobes beyond their middle, serrated, beneath with 1–3 glands on the nerves, and pale with a hoary pubescence; sinus rounded; lobes dilated upwards and again lobed: segments of the involucel linear-oblong, about equal to the ovate divisions of the calyx: carpels pubescent, echinated.—*α*; middle lobe of the upper leaves about equal to the others.—U. sinuata, *DC. prod.* 1.

Digitized by Google

p. 442; *Spr. syst.* 1. *p.* 97; *Roxb. hort. Bengh.*; *in E. I. C. mus. tab.* 1155.—U. morifolia, *DC.*? *l. c.*—U. muricata, *DC. l. c.* (young state).—U. lappago, *Sm.*?; *DC. prod.* 1. *p.* 441.—U. heterophylla, *Wall.! L. n.* 1933. *g.* "*H. B. C.*" —*Pluk. t.* 5. *f.* 3; *Rheed. Mal.* 10. *t.* 2 (not good); *Rumph. Amb.* 6. *t.* 25. *f.* 2 (bad).—*β*; middle lobe of the upper leaves much attenuated at its base, and longer than the others.—*Wight! cat. n.* 171.—U. heterophylla, *Sm.*; *DC. prod.* 1. *p.* 442; *Spr. syst.* 3. *p.* 97; *Wall.! L. n.* 1933. *g.* "*Mungher.*"—*Burm. Zeyl. t.* 69. *f.* 2; *Pluk. t.* 74. *f.* 1.——Common in the southern parts of the Peninsula.

The number of glands, the pubescence, and shape of the leaves, vary on the same specimen, so that the above distinctions between the varieties are not very constant, and depend perhaps more upon age. The deeper cut leaves principally distinguish this from *U. Americana*, with which *U. sinuata*, Sw., and *U. paradoxa*, H. B. K., are surely the same.

IV. PAVONIA. *Cav.*; *Lam. ill. t.* 585.

Calyx 5-cleft, persistent, surrounded by a 5–15-leaved involucel. Ovarium with 5, or rarely 4, 1-ovuled cells. Style 1, 8–10-cleft at the apex. Stigmas 8–10. Carpels 5, or rarely 4, capsular, connivent, 2-valved, 1-seeded. Radicle inferior.

169. (1) P. *odorata* (Willd.:) stems herbaceous, viscidly hairy: leaves cordate, roundish ovate, lower ones sometimes entire; upper ones with three short acute lobes, toothed, more or less hairy and viscid: pedicels axillary, 1-flowered, somewhat racemose at the top of the stem and of the short axillary branches: leaves of the involucel about 12, ciliated, longer than the calyx: carpels not prickly.—*DC. prod.* 1. *p.* 444; *Spr. syst.* 3. *p.* 99; *Wall.! L. n.* 1886; *Wight! cat. n.* 176.—P. sidoides, *Horn.*; *DC. prod.* 1. *p.* 444.—Hibiscus morifolius, *Rottl.! in. Herb. Smith.*—H. odoratus, *Roxb. hort. Bengh.*—H. Chittle-Benda, *Roxb. in E. I. C. mus. tab.* 354.——Gingie and Dindygul hills. Vendaloore.

170. (2) P. *Zeylanica* (Cav.:) lower leaves somewhat roundish-cordate, crenated; upper ones deeply 3–5-lobed, coarsely toothed: pedicels axillary, 1-flowered: leaves of the involucel 10, ciliated, longer than the calyx: carpels unarmed.—*DC. prod.* 1. *p.* 444; *Spr. syst.* 3. *p.* 99; *Wall.! L. n.* 1885; *Wight! cat. n.* 174.—Hibiscus Zeylanicus, *Linn.*—*Pluk. t.* 125. *f.* 3.—— Trichinopoly.

V. LEBRETONIA. *Schrank.*

Calyx 5-partite, surrounded by a 5-partite involucel of about the same length. Petals 5, the part protruded beyond the calyx with a twisted estivation; limb spreading. Styles 5, each bipartite. Stigmas 10. Carpels 5, or 4 by abortion, unarmed, 1-seeded, indehiscent.

Closely allied to *Pavonia*, but with carpels as in *Malva*.

171. (1) L. *procumbens* (Wight:) procumbent, more or less pubescent: leaves roundish cordate, with three acutish lobes or angles, the middle one the longest, between crenated and serrated: pedicels axillary, solitary, 1-flowered, about as long as the leaf: corolla (yellow) 2–3 times longer than the ovate-leaved involucel: carpels prominently reticulated and wrinkled on the back.—*Wall.! L. n.* 2688; *Wight. cat. n.* 173.—*Pluk. t.* 352. *f.* 5 (good.)

Dr Wallich doubts if this and his *L. flava* be distinct: we are not acquainted with that species.

VI. HIBISCUS. *Linn.*; *Lam. ill. t.* 584; *Gærtn. fr. t.* 134.

Calyx 5-cleft, surrounded by a many- or sometimes few-leaved involucel,

Digitized by Google

with its leaves usually distinct, and sometimes united together at their base or as far as their middle. Petals not auricled on the one side: ovary 5-celled: cells with 3 or many ovules. Style 1, 5-cleft at the apex. Stigmas 5. Carpels united into a 5-celled, 5-valved, loculicidal capsule: margin of the valves not introflexed; cells usually many-, rarely by abortion 1-seeded.

§ 1. Trionum; *involucel many-leaved; calyx becoming inflated, bladdery, membranaceous, and strongly nerved; carpels many-seeded; seeds glabrous.*

172. (1) H. *vesicarius* (Cav.:) leaves toothed; lower ones undivided; upper ones 5-cleft, the lobes oblong obtuse and nearly equal in size.—*DC. prod.* 1. *p.* 453; *Spr. syst.* 3. *p.* 106; *Wight! cat. n.* 201.—H. dissectus, *Wall.? L. n.* 2696.

Probably this and all the others of the section are mere variations of *H. Trionum*, which seems to be found all over the world.

§ 2. Furcaria; *leaves of the involucel distinct, divaricately forked or with a large tooth or other appendage; calyx not inflated; carpels many-seeded; seeds glabrous.*

173. (2) H. *Surattensis* (Linn.:) stem herbaceous, and as well as the petioles and pedicels rough with small recurved prickles: stipules half cordate, broad, foliaceous: leaves palmately 3–5-lobed, on long petioles: pedicels elongated, shorter than the petioles: leaves of the involucel linear, incurved, furnished on their back about the middle with an oblong foliaceous spreading appendage.—*DC. prod.* 1. *p.* 449; *Spr. syst.* 3. *p.* 102; *Cav. diss.* 3. *t.* 33. *f.* 1; *Wall.! L. n.* 1893; *Wight! cat. n.* 209.—H. furcatus, *Wall.! L. n.* 1896. *c* (not *Roxb.*)—*Rheed. Mal.* 6. *t.* 44; *Rumph. Amb.* 4. *t.* 16; *Pluk. t.* 5. *f.* 4.

174. (3) H. *furcatus* (Roxb.:) stem erect, somewhat woody, softly pubescent, and as well as the petioles and pedicels rough with numerous small recurved prickles: stipules oblong or lanceolate: leaves palmately 3–5-lobed, under side densely pubescent; nerves beneath prickly: pedicels rather shorter than the petioles: leaves of the involucel about 10, linear, incurved, with an oblong foliaceous spreading appendage at their back about the middle.—*Roxb. hort. Bengh. p.* 51; *DC. prod.* 1. *p.* 449; *Spr. syst.* 3. *p.* 102; *Wall. L. n.* 1896. *a, b?, d; Wight! cat. n.* 959.—H. bifurcatus, *Roxb. in E. I. C. mus. t.* 1582 (not of *Willd.* nor of *Hort. Bengh.*)——Southern provinces.

Very closely allied to *H. Surattensis*, differing principally by the shape of the stipules.

* 175. (4) H. *radiatus* (Cav.:) suffruticose; stem rough with rigid prickles: stipules lanceolate: leaves 5–7-partite: segments lanceolate, acuminated, serrated: pedicels very short, without prickles: leaves of the involucel rigidly ciliated, with a sharp tooth on the one side about the middle.—*Cav. Diss.* 3. *p.* 150. *t.* 54. *f.* 2; *DC. prod.* 1. *p.* 449; *Roxb. in E. I. C. mus. tab.* 1584; *Wall. L.* 1894. *a, b.*

Roxburgh remarks that it is common in gardens, but that its native country is uncertain: in Mr Arnott's herbarium is a specimen from Jamaica.—Wallich's! No. 1894. *c.* is *H. diversifolius*, Jacq., and the same as Wall. L. n. 1897.

§ 3. Ketmia; *leaves of the involucel distinct, simple, entire or rarely split; calyx not inflated; carpels many-seeded; seeds glabrous, or pubescent, or with a line of dense longish elastic hairs along their back.*

176. (5) H. *Lampas* (Cav.:) arborescent, without prickles: leaves cordate, 3-lobed; lobes spreading acuminated; upper sides sprinkled with minute stellate hairs but otherwise glabrous, under tomentose; middle nerve with a glandular pore beneath: peduncles axillary, elongated, about 3-flowered,

Digitized by Google

with very small leaves or bractese at the base of the pedicels: involucel minute, consisting of 5–7 distant subulate leaflets arising from the thickened apex of the pedicel: calyx nearly truncated, with 5 distant subulate teeth: corolla convolute and forming a tube at the base.—*Cav. diss.* 3. *p.* 154. *t.* 56. *f.* 2; *DC. prod.* 1. *p.* 447; *Spr. syst.* 3. *p.* 101; *Wall.! L. n.* 1889; *Wight! cat. n.* 219.—H. Gangeticus, *Roxb. in E. I. C. mus. tab.* 1502.—Paritium Gangeticum, *G. Don.*——Travancore.

De Candolle's character is erroneous. The fruit is, we believe, unknown; and probably this species belongs to *Thespesia*.

177. (6) H. *sidoides* (W. & A.:) suffrutescent, without prickles: leaves oblong, obtuse, crenated, with a soft short tomentum on both sides particularly beneath: peduncles about as long as the petioles, 3–4-flowered, leafless: flowers approximated: leaves of the involucel linear-lanceolate, about equal to and resembling the calyx: fruit globose: seeds tuberculated, glabrous.—*Wight! cat. n.* 58.—H. Wightianus, *Wall. L. n.* 2695?——Madura.

The present is almost the only plant in the genus which we cannot refer satisfactorily to some other species in Wallich's List, and therefore we presume it is his No. 2695; but we are far from certain: this may perhaps rather be his *H. setosus*? n. 1902. *c*; in which case his *H. Wightianus* must belong to the following.

178. (7) H. *lunarifolius* (Willd.:) stems herbaceous, clothed with adpressed hairs, but not prickly: leaves on longish petioles, roundish cordate, slightly and acutely 3–5-lobed, serrated; upper side sprinkled sparingly, under copiously, with shining brittle 3–4-partite hairs: pedicels very short, thickened below the flower, very hairy, axillary or by the absence of leaves disposed in a long terminal raceme: leaves of the involucel about 10, linear, acuminated, rather longer than the calyx: segments of the calyx linear; sinus rounded: corolla tubular below, about 4 times longer than the calyx: capsule nearly globose, acuminated: seeds glabrous, with a very few small tubercles.—*DC. prod.* 1. *p.* 451; *Spr. syst.* 3. *p.* 105; *Wight! cat. n.* 223.—H. pruriens, *Roxb. hort. Bengh. p.* 51; *in E. I. C. mus. tab.* 359; *DC.? prod.* 1. *p.* 448; *Spr.? syst.* 3. *p.* 105; *Wall.! L. n.* 1892.——Dindygul.

De Candolle and Sprengel say that the corolla is only as long as the calyx, so that if theirs be the true plant, which is probable, the flowers must be in a state of abortion, or not expanded. Perhaps Wallich's *H. Wightianus* may be the entire leaved state of this species.

179. (8) H. *Rosa-sinensis* (Linn.:) stem arborescent, without prickles: leaves ovate, acuminated, quite glabrous, or sprinkled beneath with a very few short soft hairs particularly on the nerves, quite entire towards the base, coarsely toothed and slightly cut towards the apex: pedicels axillary, as long or longer than the leaves, jointed above their middle: leaves of the involucel 6–7, linear, about half as long as the tubular 5-cleft calyx: corolla tubular below.—*DC. prod.* 1. *p.* 448; *Spr. syst.* 3. *p.* 103; *Wall.! L. n.* 1890; *Wight! cat. n.* 212 *and* 221.—*Rheed. Mal.* 2. *t.* 16; *Rumph. Amb.* 4. *t.* 8.

The seeds are unknown, and the fruit, we believe, has been only described by Loureiro. If the seeds prove to have a dense line of elastic hairs, as in the allied *H. syriacus* (with which *H. rhombifolius*, Cav. and DC. prod. 1. p. 452, and the *Bonga raja alba* of Rumphius, are mere varieties), then it may be better to alter slightly the sectional character, and to include them both among the *Bombicellæ*, with which they have certainly more affinity.

180. (9) H. *canescens* (Heyne:) stem shrubby, without prickles: leaves on long petioles, roundish cordate, 7-nerved at the base, slightly and acutely lobed, upper ones sometimes entire, repand, minutely and distantly toothed by the excurrent nerves; upper side nearly glabrous, under harshly tomentose: stipules long and setaceous: pedicels short, angled, dilated under the flower: leaves of the involucel 5, linear-subulate and very sharp at the point,

Digitized by Google

longitudinally striated, longer than the 5-cleft calyx: sepals 3-nerved, margin thin: corolla tubular below: seeds pubescent.—*Heyne! in Wall. L. n.* 2698; *Wight! cat. n.* 222.—H. septemnervosus, *Wight! in Wall. L. n.* 2693.—H. Borbonicus, *Wight! in Wall. L. n.* 2694 (not *Link.?*)——Mysore. Madura. Gingie hills.

As we have not at present access to the figure given by Link and Otto, we dare not refer this plant to Willdenow's *H. acerifolius*, which is said to have a setaceous 6–7-leaved involucel; but the character presents no other difference.

181. (10) H. *panduriformis* (Burm.:) stem herbaceous, without prickles, pubescent and covered with rigid spreading divided hairs: leaves cordate, unequally toothed, upper side hispidly tomentose, under with a soft whitish dense tomentum; lower ones roundish and slightly 5-lobed, upper ones usually acuminated: pedicels axillary, 1-flowered, very short: leaves of the involucel 8, linear and slightly spathulate, erect with the apex patulous or recurved, shorter than the 5-cleft calyx: corolla tubular: capsule ovoid, pointed, very hairy.—*Burm. Ind. p.* 151. *t.* 47. *f.* 2 (bad); *DC. prod.* 1. *p.* 455; *Spr. syst.* 3. *p.* 105; *Wight! cat. n.* 213.—H. tubulosus, *Cav. diss.* 3. *p.* 161. *t.* 68. *f.* 2; *DC. prod.* 1. *p.* 447; *Spr. syst.* 3. *p.* 101; *Roxb. hort. Bengh. p.* 51.—H. pilosus, *Roxb. in E. I. C. mus. tab.* 672.—H. setosus, *Wall.! L. n.* 1902. *c–g* (not *Roxb.*)—H. velutinus, *DC.? prod.* 1. *p.* 452; *Spr.? syst.* 3. *p.* 104.——Southern provinces.

The seeds are usually pubescent, but a specimen before us has them glabrous, although otherwise quite the same. The *H. setosus* of Roxb. in E. I. C. mus. tab. 1271, and probably Wall. L. 1902. *a, b*, has the hairs on the stem erect and close pressed, leaves large cordate and entire, the leaves of the involucel lanceolate, and united to their middle as in *Paritium tiliaceum*, to which genus it perhaps belongs; and the seed with long fulvous hair: indeed it seems to be in no respect distinct from *H. macrophyllus*, Roxb. and Wall. pl. Asiat. rar. t. 51.

182. (11) H. *cannabinus* (Linn.:) stem herbaceous, glabrous, prickly: leaves palmately 5-partite, glabrous; segments narrow lanceolate, acuminated, serrated; middle nerve with a gland beneath: flowers almost sessile, axillary: leaves of the involucel about 9, subulate, prickly with rigid bristles, shorter than the undivided portion of the calyx: calyx divided beyond the middle; segments lanceolate-subulate, slightly prickly, 1-nerved, with a large gland about the middle of each nerve: corolla spreading: fruit nearly globose, acuminated, very hairy: seeds glabrous.—*DC. prod.* 1. *p.* 450; *Spr. syst.* 3. *p.* 103; *Wall.! L. n.* 1898; *Wight! cat. n.* 204.——Negapatam.

183. (12) H. *vitifolius* (Linn.:) stem scarcely with any prickles, herbaceous: leaves roundish cordate, unequally toothed or crenated, with about 5 acute or obtuse angles or lobes; upper side nearly smooth or tomentose, under more or less softly tomentose: pedicels drooping, scarcely so long as the petioles: leaves of the involucel about 12, subulate, as long as the undivided portion of the calyx: calyx divided to the middle; segments triangular: corolla patent: carpels hairy, compressed at the back at the line of dehiscence into a short wing: seeds slightly tuberculated.—*DC. prod.* 1. *p.* 450; *Spr. syst.* 3. *p.* 103; *Wall.! L. n.* 1899; *Wight! cat. n.* 210 (leaves very tomentose on both sides, and lobes acuminated), *and* 211 (leaves more glabrous above, and lobes obtuse or somewhat acute).—H. obtusifolius, *Willd.; Rottl.!; DC. prod. l. c; Spr. syst. l. c.*—H. truncatus, *Roxb. hort. Bengh.; in E. I. C. mus. tab.* 1581.—*Rheed. Mal.* 6. *t.* 46.——From Madras to Negapatam. Malabar.

So endless are the forms of the leaves of this plant that we dare not characterise varieties. Roxburgh attempts to distinguish his *H. truncatus* (the same state with Willdenow's *H. obtusifolius*), by the position of the joint of the pedicel: we have, however, always found it about the middle.

Digitized by Google

184. (13) H. *mutabilis* (Linn.!) arborescent, without prickles: leaves cordate, with 5 acute angles or lobes, toothed, and as well as the branches more or less tomentose: pedicels elongated, almost the length of the leaf, jointed a little below the flower: leaves of the involucel 8–10, linear, twice as short as the calyx: calyx-segments ovate, acuminated, 3-nerved: corolla spreading: capsule orbicular, flattened horizontally, hairy outside and inside: seeds reniform.—*DC. prod.* 1. *p.* 452; *Spr. syst.* 3. *p.* 104; *Wall. L. n.* 1907; *Wight! cat. n.* 220.—*Rheed. Mal.* 6. *t.* 38, 39, 40, 41, 42; *Rumph. amb.* 4. *t.* 9.

Rheede figures the seeds as hairy; Rumphius describes them only as wrinkled; we have not seen them.

185. (14) H. *eriocarpus* (DC.:) stem arborescent, glabrous, without prickles: leaves glabrous or very slightly sprinkled with minute divided hairs, cordate, 3-lobed; lobes usually oblong acuminated, repand-toothed or entire: pedicels rather longer than the petioles: leaves of the involucel 8–9, oblong-acuminated, waved, slightly toothed, often split down the middle, about as long as the calyx: calyx-segments oblong-lanceolate, 1-nerved: corolla very spreading; claws with a tuft of hair on each side: capsule orbicular, slightly flattened, very hairy inside and outside: seeds spherical, glabrous.—*DC. prod.* 1. *p.* 452; *Spr. Syst.* 3. *p.* 104; *Wight! cat. n.* 214.—H. collinus, *Roxb. hort. Bengh. p.* 51; *Wall. L. n.* 1908.—H. simplex, *Roxb. in E. I. C. mus. tab.* 360; *G. Don in Mill. Dict.*

§ 4. Bombicella; *leaves of the involucel distinct, simple; calyx not inflated; carpels many-seeded; seeds covered with numerous soft woolly or long silky hairs.*

186. (15) H. *hirtus* (Linn.!) shrubby: leaves on hairy petioles, ovate, acuminated, or (the lower ones) cordate, slightly and acutely 3-lobed, strongly serrated, harsh, slightly hairy, with a large gland beneath on the middle nerve; serratures in the young leaves terminated by a bristle: pedicels axillary, covered with stiff patent hairs, longer than the leaf, jointed a little below the flowers, slightly thickened above the joint: involucel-leaves 5–7, subulate, hairy, shorter than the calyx: calyx deeply divided; segments linear-lanceolate, hairy: corolla patent.—*Poir. in Encycl. Meth.* 3. *p.* 356; *Wight! cat. n.* 208.—H. Rosa Malabarica, *Koen.*; *Ker in Bot. reg. t.* 337; *Spr. syst.* 3. *p.* 105.—H. phœniceus, *Willd.* (excl. syn. *Linn. Supp.* and *H. hirtus*, Cav.); *DC. prod.* 1. *p.* 452 (partly); *Spr. syst.* 3. *p.* 105 (partly); *Cav. diss.* 3. *t.* 67. *f.* 2. (excl. *f.*); *Roxb. in E. I. C. mus. tab.* 357; *Wall.! L. n.* 1904.—*Pluk. t.* 254. *f.* 3; *Rheed. Mal.* 10. *t.* 1.——Coromandel and Malabar.

Poiret has well distinguished *H. hirtus* and *H. phœniceus*: Cavanilles has exactly reversed the two names. The plant in De Candolle's herbarium, from the Montpellier garden, of which Mr Arnott possesses a specimen, compared with De Candolle's, is *H. phœniceus*, Jacq.; it is almost glabrous, has 9–10 glabrous involucel-leaves as long as the calyx, the pedicel jointed about the middle, stamens declinate; and is one and the same with *H. unilateralis*, Cav.; a plant only at present known in cultivation, and probably obtained from the West Indies.

187. (16) H. *micranthus* (Linn.!) shrubby: leaves ovate or roundish, entire, acutely serrated, rough with bristly hairs: pedicels axillary, longer than the leaf: involucel-leaves 7, setaceous, shorter than the calyx: corolla reflexed.—*Cav. diss.* 3. *t.* 66. *f.* 1; *DC. prod.* 1. *p.* 453; *Spr. syst.* 3. *p.* 106; *Wight! cat. n.* 207.—H. rigidus, *Linn.!*; *Roxb. in E. I. C. mus. tab.* 358; *Wall.! L. n.* 1905.——Negapatam, common.

The natives, particularly children, eat the green tender capsules of both this and the last. ROXB. MSS.

Digitized by Google

§ 5. Sabdariffa; *leaves of the involucel more or less united from the base to the middle; calyx not inflated; carpels many-seeded; seeds glabrous.*

188. (17) H. *Sabdariffa* (Linn.:) annual, glabrous: lower leaves undivided; upper palmately 3–5-lobed, cuneate and entire at the base: lobes oblong-lanceolate, acuminated, toothed: flowers axillary, solitary, on very short pedicels: involucel-segments about 12.—*Cav. diss.* 3. *p.* 170, *and* 6. *p.* 351. *t.* 198. *f.* 1; *DC. prod.* 1. *p.* 453; *Spr. syst.* 3. *p.* 107; *Wall.! L. n.* 1909; *Wight! cat. n.* 218.—*Pluk. t.* 6. *f.* 2.

VII. PARITIUM. *St Hil.*

Calyx surrounded by a 10–14-toothed or cleft involucel, shorter than the calyx. Petals not auricled. Staminiferous tube 5-toothed, naked. Style 5-cleft, with 5 stigmas, exserted beyond the staminiferous tube. Carpels united into a 5-celled, 5-valved, loculicidal capsule; margin of the valves introflexed, the capsule thus appearing imperfectly 10-celled; cells several-seeded.—Trees or shrubs. Leaves entire, crenated, or lobed; 1 or 3 of the nerves beneath glandular at the base. Stipules broad, ovate. Peduncles 1-flowered, axillary, or terminal and bibracteolate.

189. (1) P. *tiliaceum* (St Hil.:) leaves crenulated, sometimes quite entire, roundish-cordate with a sudden acumination, 7–11 nerved; upper side glabrous, under hoary with pubescence: stipules ovate: involucel 10-lobed.—*Wight! cat. n.* 216.—Hibiscus tiliaceus, *Linn.; DC. prod.* 1. *p.* 454; *Spr. syst.* 3. *p.* 106; *Roxb. hort. Bengh. in E. I. C. mus. t.* 1500; *Wall.! L. n.* 1912.—H. similis, *Blume.*—H. elatus, circinnatus, *and* Guinensis, *DC. l. c; Spr. syst.* 3. *p.* 107.—*Rumph. Amb.* 2. *t.* 73; *Rheed. Mal.* 1. *t.* 30; *Pluk. t.* 355. *f.* 5; *t.* 178. *f.* 3.——Malabar and Travancore.

As Roxburgh (Hort. Bengh. p. 5.) quotes the figure in the Hort. Mal. for his *H. tortuosus* (Wall. L. n. 1913), probably that also is not distinct.

* 190 (2) P. *tricuspis* (G. Don:) leaves hoary beneath, rounded at the base, with 3 divaricating lanceolate slightly toothed or entire lobes: stipules ovate: involucel 9–10 lobed.—*Wight! cat. n.* 217.—Hibiscus tricuspus, *Banks; DC. prod.* 1. *p.* 453; *Spr. syst.* 3. *p.* 106; *Cav. diss.* 3. *t.* 55. *f.* 2; *Wall.! L. n.* 1914.

Roxburgh affirms that this was introduced into India from the Society Islands.

VIII. DECASCHISTIA. *W. & A.*

Calyx 5-cleft, surrounded by an involucel of 10 leaves more or less unequally united at the base. Petals not auricled. Style exserted beyond the staminiferous column, 10-cleft, with 10 stigmas: segments hairy. Carpels united into a 10-celled, 10-valved, loculicidal capsule; valves attached by the base to a short conical 10-angled central column. Seeds solitary in each cell, naked.—A shrub. Leaves coriaceous, ovate, entire, or slightly lobed, coarsely toothed, velvety on both sides with a short dense compact tomentum, whitish beneath; middle nerve beneath with a glandular pore near its base.

Calyx segments triangular-acuminated, with one dorsal nerve and two others forming the margins and uniting, each with the marginal one of the contiguous sepal, and decurrent along the line of junction of the sepals; seeds glabrous.

191. (1) D. *crotonifolia* (W. & A.)—*Wight! cat. n.* 215.—Hibiscus croto-

Digitized by Google

nifolius, *Wall.! L. n.* 1901.—H.? coriaceus, *Heyne mst* —H. pterospermoides, *Wight mss.*——Mysore and Madura, on high hills.

IX. ABELMOSCHUS. *Med.*

Calyx 5-toothed, spathaceous, deciduous, surrounded by a 5–10-leaved often very caducous involucel. Ovarium 5-celled; cells with many ovules. Style 1, 5-cleft at the apex. Stigmas 5. Capsule 5-celled, 5-valved, loculicidal, polyspermous. Seeds naked.

192. (1) A. *esculentus* (W. & A.:) stem herbaceous, hairy, without prickles: leaves on longish petioles, cordate, with 3–5 obtuse lobes, strongly toothed, scabrous on both sides, with short appressed rigid hairs; pedicels very short: involucel-leaves 10, deciduous: capsule pyramidal, elongated, acuminated.—*Wight! cat. n.* 206.—Hibiscus esculentus, *Linn.; DC. prod.* 1. *p.* 450; *Spr. syst.* 3. *p.* 102; *Cav. diss.* 3. *t.* 61. *f.* 2.

193. (2) A. *angulosus* (Wall.:) stems herbaceous, not prickly: leaves on long petioles, cordate, 5-lobed, unequally toothed; lobes ovate acuminated; upper side pubescent with short softish hairs, under slightly tomentose: pedicels rigidly and horizontally hairy, about as long as the petioles: involucel falling off long before the flower-buds open: calyx conical from a broad base, sepals only slightly cohering: capsule ovoid, acute, very hispid.—*Wall.! L. n.* 1927; *Wight! cat. n.* 202.——Neelgherries.

So fugacious is the involucel that we have not been able to see it on our specimens.

194. (3) A. *rugosus* (Wall.:) all over hispid with bristly hairs, except the pedicels: stems herbaceous, not prickly: leaves on long petioles, tomentose, toothed, 5-lobed; the two lower lobes usually oblong, slightly obtuse, pointing downwards, and scarcely diverging; upper ones lanceolate, acuminated: pedicels shortish, arranged in a longish terminal raceme without leaves: involucel-leaves 10, setaceous, persistent: capsule ovoid, very hairy.—*Wall.! L. n.* 1923; *Wight! cat. n.* 203.——Madura hills.

195. (4) A. *moschatus* (Moench:) stem herbaceous, hispid with spreading hairs, not prickly: leaves, and long petioles, hispid with rigid hairs but otherwise glabrous, unequally and coarsely toothed, deeply 5–7 lobed; lobes all spreading, oblong or lanceolate, acuminated: pedicels harshly pubescent, axillary, about as long as the petioles: involucel-leaves 6–10, linear, hairy, somewhat persistent: capsule oblong, acuminated, hairy.—*Wall. L. p.* 87. *n.* 1915; *Wight! cat. n.* 203.—Hibiscus moschatus, *Roxb. in E. I. C. mus. t.* 1503.—H. Abelmoschus, *Linn.; DC. prod.* 1. *p.* 452; *Spr. syst.* 3. *p.* 104.—H. longifolius, *Willd.; DC. prod.* 1. *p.* 450; *Spr. syst.* 3. *p.* 102; *Wight! in Wall. L. n.* 2699.—H. pseudo-abelmoschus, *Blume* (not *Roxb.*)—H. flavescens, *Cav. diss.* 3. *p.* 174. *t.* 70. *f.* 3. (according to Poiret in Encycl. Meth. 3. p. 364); *DC. prod.* 1. *p.* 454.—*Rheed. Mal.* 2. *t.* 38.——Madura and Courtallum.

196. (5) A. *ficulneus* (W. & A.:) stem herbaceous, prickly with small sharp tubercles: leaves on long petioles, hispid with short hairs, palmately 5-lobed, upper ones 3-lobed; lobes oblong, obtuse, narrowed towards the base, unequally toothed: pedicels about half the length of the petioles, upper ones arranged in a leafless raceme: involucel-leaves 5, lanceolate, usually very caducous: calyx oblong, acuminated, 5-toothed, hispidly tomentose: fruit ovoid, harshly tomentose.—*Wight! cat. n.* 205.—Hibiscus ficulneus, *Linn.; DC. prod.* 1. *p.* 448; *Spr. syst.* 3. *p.* 102; *Wall.! L. n.* 2697.—H. sinuatus, *Cav. diss.* 3. *t.* 52. *f.* 2. (bad).—Lagunea aculeata, *Cav. diss.* 3. *p.* 173. *t.* 71. *f.* 1. (pretty good); *DC. prod.* 1. *p.* 474; *Spr. syst.* 3. *p.* 123; *Lam. ill. t.* 577.—*Dill. hort. Elth. t.* 157. *f.* 190.——Naturalized at Trevalore near Negapatam, but a native of the southern provinces of the Peninsula.

Digitized by Google

X. THESPESIA. *Corr.*

Calyx truncated, surrounded by a caducous 3-leaved involucel. Style simple, 5-sulcated towards the apex, with 5 points or stigmas. Carpels 5, united into a 5-celled coriaceous capsule not spontaneously dehiscing; cells with an introflexed membrane in the middle at their back, about 4-seeded.—Trees. Leaves cordate, acuminated, quite entire.

197. (1) T. *populnea* (Corr.:) young parts, and leaves beneath, sprinkled with minute rusty-coloured scales: leaves roundish cordate, acuminated, 5–7-nerved, with pores beneath at the base between the nerves: pedicels about as long as the petioles.—*DC. prod.* 1. *p.* 456; *Spr. syst.* 3. *p.* 96; *Wall.! L. n.* 1888; *Wight! cat. n.* 172.—Hibiscus populneus, *Linn.; Roxb. in E. I. C. mus. tab.* 351.—H. populneoides, *Roxb. l. c. tab.* 352.—Malvaviscus populneus, *Gærtn. fr. t.* 135.—*Rheed. Mal.* 1. *t.* 29.

Blume separates from this the plant in Rumph. Amb. 2. t. 74, under the name of *T. macrophylla*, the pedicels being shorter than the petioles; we doubt much if that be sufficient. Roxburgh's *Hib. populneoides*, which he only observed in gardens about Courtallum, is merely a state with the acumination of the leaves a little longer than usual, and their margins slightly waved: he attempts to point out a difference also in the fruit.

XI. GOSSYPIUM. *Linn.; Lam. ill. t.* 586; *Gærtn. fr. t.* 134.

Calyx cup-shaped, obtusely 5-toothed, surrounded by a 3-leaved involucel, with the leaves united and cordate at the base and deeply cut or toothed irregularly. Style simple, marked with 3 or 5 furrows towards the apex. Stigmas usually 3, sometimes 5. Capsules 3–5-celled, 3–5-valved at the apex, loculicidal. Seeds numerous, imbedded in cotton.—Young branches and leaves more or less conspicuously covered with little black dots; nerves below usually with one or more glands.

M. Rohr has long ago pointed out, from many years experience in the West Indies, that constant characters could not be obtained from the shape of the leaves, their glands, or the involucel, but must be looked for in the seed. Dr F. Buchanan Hamilton (Linn. Trans. v. 13. p. 492) makes the same remark, and adds, that "the plant being annual, or growing to a small tree with a woody stem lasting for years, is a mere accidental circumstance, owing to the manner of treatment." In dividing the genus into species, we therefore follow this last writer, who mentions that the pubescence is a better criterion than either the number and form of the lobes of the leaf, or the number of the glands, for distinguishing the varieties. M. Rohr divides the cotton plants with which he was acquainted into,—1. those with seeds black and rough; 2. with seeds brownish-black and veined; 3. seeds sprinkled with short hairs; 4. seeds completely covered with a close down: which characters, combined with the colour of the cotton, and its mode of attachment to the seed, and the shape of the seed, we recommend to the attention of those who have the means of studying them in the living state; as it is almost necessary that dried specimens in leaf, flower, and ripe fruit, be accompanied by remarks, before botanists can clear up this genus with any kind of satisfaction.

198. (1) G. *album* (Ham.:) seeds and cotton both white.—*Wight! cat. n.* 176, 178.—G. herbaceum, *Linn.; DC. prod.* 1. *p.* 456; *Spr. syst.* 3. *p.* 95; *Roxb. in E. I. C. mus. t.* 1493; *Wall. L. n.* 1880.—G. hirsutum, *Linn.; DC. prod.* 1. *p.* 456; *Spr. syst.* 3. *p.* 96.—G. obtusifolium, *Roxb. in E. I. C. mus. tab.* 1495.—G. tricuspidatum, *Lam.*—G. eglandulosum, *Cav.?; DC. l. c.*—*Pluk. t.* 188. *f.* 1. *and* 2; *Rheed. Mal.* 1. *t.* 31.

Hamilton refers Rheede's figure to the next, but that author describes the seeds as white. *G. micranthum*, Cav., appears to be a glabrous variety.

199. (2) G. *nigrum* (Ham.!) seeds black, cotton white.—*α*; stems and leaves more or less hairy or pubescent; flowers yellowish.—*Wight! cat. n.*

Digitized by Google

177.—G. Indicum, *Lam.; DC. prod.* 1. *p.* 456; *Spr. syst.* 3. *p.* 96.—G. vitifolium, *Lam.; DC. l. c.; Spr. l. c.; Roxb. in E. I. C. mus. tab.* 1498; *Wall. L. n.* 1875. *a, c, d, k.*—G. Peruvianum, *Cav.; DC. l. c.; Spr. l. c.*—G. latifolium, *Murr.; DC. l. c.—Rumph. Amb.* 4. *t.* 12, 13.—*β*; stem and leaves quite glabrous; flowers yellowish.—*Wight! cat. n.* 180.—G. Barbadense, *Linn.; DC. l. c.; Spr. l. c.; Roxb. in E. I. C. mus. tab.* 1499.—G. Javanicum, *Blume.*—G. racemosum, *Poir.; DC. l. c. p.* 457.—G. glabrum, *Poir.*—G. vitifolium, *Wall.! L. n.* 1875. *h.—Pluk. t.* 299. *f.* 1.—*γ*; stem and leaves more or less pubescent, sometimes nearly glabrous; flowers copper-coloured.—*Wight! cat. n.* 179.—G. rubicundum, *Roxb. in E. I. C. mus. t.* 1496.—G. arboreum, *Linn.!; DC. l. c. p.* 456; *Spr. l. c.; Wall.! L. n.* 1881.—G. purpurascens, *Poir.; DC. l. c. p.* 457.—G. vitifolium, *Wall.! L. n.* 1875. *i. l.—Pluk. t.* 188. *f.* 3.

* 200. (3) G. *religiosum* (Sw.:) seeds black; cotton copper-coloured.—*Swartz. act. Holm.* 1790. *p.* 21; *Willd. sp.* 3. *p.* 805; *DC. prod.* 1. *p.* 456; *Spr. syst.* 3. *p.* 95.—G. croceum, *Ham.*—G. vitifolium, *Wall.! L. n.* 1875. *n.*

XII. LAGUNEA. *Cav.*

Calyx 5-cleft, persistent, without an involucel. Ovarium 5-celled; cells with 5–6 ovules. Style 1, 5-cleft at the apex. Carpels united into a 5-celled, 5-valved, loculicidal capsule, the margin of the valves not introflexed; cells 5–6-seeded.

This genus only differs from *Hibiscus* by the total absence of an involucel: the original species, the *L. aculeata*, Cav., belongs to *Abelmoschus*.

201. (1) L. *lobata* (Willd.:) herbaceous: lower leaves petioled, cordate, upper ones palmate, cut; uppermost trifid or lanceolate: pedicels slender, 1-flowered, arranged in a terminal lax, leafless, raceme.—*Cav. diss.* 5. *t.* 136. *f.* 1; *DC. prod.* 1. *p.* 474; *Spr. syst.* 3. *p.* 123; *Wall.! L. n.* 1876; *Wight! cat. n.* 181.—Solandra lobata, *Murr.; Lam. ill. t.* 580.—Triguera acerifolia, *Cav. diss.* 1. *p.* 41. *t.* 11.—Hibiscus solandra, *L'Her. st. t.* 49.—Sida heterophylla, *Heyne!*—S. diversifolia, *Spr. syst.* 3. *p.* 116.——Dindygul and Gingie hills. Coromandel; *Roxburgh.*

XIII. ABUTILON. *Dill.; Kunth; Lam. ill. t.* 578. *f.* 2; *Gærtn. fr. t.* 135.

Calyx 5-cleft, persistent, without an involucel. Ovary 5- or many-celled, with 3, rarely more, ovules in each cell. Styles 5 or more. Stigmas capitate. Capsule composed of 5 or more, 3- or rarely 4–6-seeded, 2-valved, cocci.—Leaves cordate. Peduncles axillary, solitary or rarely in pairs, 1- or 2- or many-flowered; sometimes, by the abortion of the upper leaves, forming terminal spikes.

202. (1) A. *polyandrum* (W. & A.:) leaves roundish cordate, with a sudden longish acumination, distantly repand-toothed, younger ones reticulated beneath and velvety: peduncles arranged in small-leaved terminal racemes; pedicels longer than the leaves: stamens united into a very short column at their base: carpels 5, twice as long as the calyx.—*Wight! cat. n.* 184.—Sida polyandra, *Roxb.; Wall.! L. n.* 1851.—S. Persica, *Burm. ind. t.* 47. *f.* 1; *Cav. diss.* 1. *t.* 4. *f.* 1; *DC. prod.* 1. *p.* 473.——Nundidroog. Neelgherries.

* 203. (2) A. *periplocifolium* (G. Don:) leaves cordate-lanceolate, acuminated, quite entire, slightly scabrous above, tomentose beneath, upper ones nearly sessile: pedicels slender, solitary or in pairs, axillary or in an elongated lax terminal raceme, jointed a little under the flower: carpels 5, ovate acuminated.—Sida periplocifolia, *Linn.; DC. prod.* 1. *p.* 467; *Spr. syst.* 3. *p.* 114; *Wall.! L. n.* 1861.—*Dillen. Elth. t.* 3. *f.* 2; *Pluk. t.* 74. *f.* 7.—— From the Missionaries' garden.

Digitized by Google

204. (3) A. *crispum* (G. Don:) leaves cordate, acuminated, crenated, whitish and slightly velvety, upper ones nearly sessile: pedicels solitary slender, bent downwards when in fruit: calyx reflexed: fruit globose inflated, membranaceous; carpels 12–13, not awned, waved and curled, hairy on the back.—*Wight! cat. n.* 185.—Sida crispa, *Linn.; DC. prod.* 1. *p.* 469; *Spr. syst.* 3. *p.* 119; *Wall.! L. n.* 1857.—Sida montana, *Roxb. in E. I. C. mus. tab.* 1491.—*Dill. Elth. t.* 5. *f.* 5.——Gingie hills. Coromandel.

205. (4) A. *Indicum* (G. Don:) leaves cordate, somewhat lobed, soft, shortly tomentose, unequally toothed: stipules reflexed: pedicels erect, longer than the petiole, jointed near the flower: calyx segments ovate, acute: corolla patent: capsule truncated, evidently longer than the calyx: carpels 11–20, acute, not awned, hairy.—α; leaves scarcely acute.—*Wight! cat. n.* 190. *b.*—Sida indica, *Linn.; DC. prod.* 1. *p.* 471; *Spr. syst.* 3. *p.* 119; *Wall.! L. n.* 1859; *Cav. diss.* 1. *t.* 7. *f.* 10.—β; leaves more or less acuminated.—*Wight! cat. n.* 190. *a.*—S. populifolia, *Lam.; DC. prod.* 1. *p.* 470; *Spr. syst.* 3. *p.* 119; *Wall.! L. n.* 1858. *d. f.; Cav. diss.* 1. *t.* 7. *f.* 9.—S. Beloere, *L'Her.*—S. Eteromischos, *Cav. diss.* 5. *t.* 128. *f.* 2.—*Rheed. Mal.* 6. *t.* 65; *Rumph. Amb.* 4. *t.* 11; *Pluk. t.* 126. *f.* 5.

Between these varieties there are no certain limits, nor can we well distinguish *S. vesicaria*, Cav., a Mexican plant. The duration is of no consequence, the Indian plant being biennial, triennial, or even perennial, according to circumstances.

206. (5) A. *Asiaticum* (G. Don:) branches pubescent, not hairy: leaves cordate, acute or acuminated, toothed, velvety on both sides: pedicels longer than the petiole, jointed near the flower: calyx-segments ovate, with a long point: capsule hairy, truncated, scarcely so long as the calyx: carpels about 20, acute, not awned.—*Wight! cat. n.* 192.—Sida Asiatica, *Linn.; DC. prod.* 1. *p.* 470; *Spr. syst.* 3. *p.* 119; *Cav. diss.* 1. *t.* 7. *f.* 2; *and diss.* 5. *t.* 128. *f.* 1.—S. populifolia, *Wall.! L. n.* 1858 *h.*

There is no character to separate this from the last except the larger calyx, and that we fear is of minor importance.

207. (6) A. *hirtum* (G. Don:) branches pubescent, sprinkled with horizontal hairs: leaves cordate acuminated, toothed, under side tomentose and hairy on the nerves: pedicels longer than the petioles, jointed near the flower: calyx segments ovate with a long point: capsule very hairy, truncated, scarcely so long as the calyx: carpels 15–20, acute, not awned.—*Wight! cat. n.* 188.—Sida hirta, *Lam.; DC. prod.* 1. *p.* 470; *Spr. syst.* 3. *p.* 119.—S. pilosa, *L'Her.*—S. populifolia, *Wall. L. n.* 1858. *g.*

208. (7) A. *graveolens* (W. & A.:) branches pubescent, sprinkled with horizontal hairs: leaves cordate, round with a short sudden acumination, toothed, velvety on both sides: pedicels about the length of the petioles, jointed near the flower: calyx-segments ovate with longish point: corolla at length reflexed: capsule hairy, truncated, rather longer than the calyx: carpels 25–30, acute, not awned.—*Wight! cat. n.* 191.—Sida graveolens, *Roxb. hort. Bengh. p.* 50; *in E. I. C. mus. tab.* 1492; *DC. prod.* 1. *p.* 473; *Spr. syst.* 3. *p.* 118; *Wall.! L. n.* 1856.—S. tomentosa, *Wall.! L. n.* 1852. *b.* (from Gonga-chora *only*).—*Rumph. Amb.* 4. *p.* 29 (good), *t.* 10 (not good).

Perhaps this, and the three preceding, are mere varieties of one and the same species; they seem, indeed, to pass by insensible gradations into each other.

209. (8) A. *tomentosum* (W. & A.:) branches pubescent and very hairy: leaves round, cordate, obtuse or acute, tomentose on both sides, toothed: pedicels stout, jointed near the flower, usually arranged in an axillary nearly leafless raceme: calyx very tomentose, segments short and broad but with a long point: petals very obliquely obcordate: capsule globose, depressed or concave, not truncated, very tomentose, shorter than the calyx: carpels reni-

Digitized by Google

form.—*Wight! cat. n.* 189 *and* 187.—Sida tomentosa, *Roxb. hort. Bengh. p.* 50; *in E. I. C. mus. tab.* 671; *Wall! L. n.* 1852. *a, b* (from H. B. C.), *c, e.*

The pedicels are from an inch to an inch and a half long, and the petioles usually about the same length or rather shorter, but in Wight's cat. n. 187, the petioles are fully three inches in length, while the pedicels are not longer than common.

XIII. SIDA. *Linn.; Lam. ill. t.* 578. *f.* 1, *and t.* 579.

Calyx 5-cleft, persistent, without an involucel. Ovarium 5- or many-celled, with a solitary ovule in each cell. Styles 5, or more, according to the number of cells. Stigmas capitate. Capsule consisting of 5 or more 1-seeded, often 2-valved, cocci. Radicle superior.

210. (1) Sida *acuta* (Burm.:) shrubby: branches without tubercles under the leaves: leaves narrow lanceolate, acuminated, glabrous, or slightly sprinkled above and on the nerves beneath with bristly hairs, coarsely simply serrated, the serratures patent: stipules linear acuminated, stiffish, striated with several longitudinal nerves, ciliated, often longer than the petiole: pedicels axillary, solitary, not shorter than the petiole nor longer than the stipules; jointed about the middle, sometimes arranged in a short axillary almost leafless branch: carpels 5–9, birostrate.—*Cav. diss.* 1. *t.* 2. *f.* 3; *DC. prod.* 1. *p.* 460; *Spr. syst.* 3. *p.* 110; *Wall.! L. n.* 1868; *Wight! cat. n.* 199, 200.—S. lanceolata, *Retz; Willd.!; Spr. l. c.*—S. Stauntoniana, *DC. l. c.*—S. scoparia, *Lour.—Pluk. t.* 334. *f.* 2; *Rheed. Mal.* 10. *t.* 53; *Rumph. Amb.* 5. *t.* 18. *f.* 2 (bad).

That our plant is the *S. acuta* of Burmann, and figured by Rheede and Plukenet, we are certain, although the descriptions hitherto given make no allowance for the variations we have observed.

211. (2) S. *stipulata* (Cav.:) suffrutescent: branches without tubercles under the leaves: leaves rhomboid-ovate, acute or acuminated, simply or doubly serrated, glabrous, or sprinkled with a short stellate pubescence, particularly on the under side: stipules linear-acuminated, striated, ciliated, about twice the length of the petioles: pedicels axillary, solitary, as long as the petioles or sometimes as long as the stipules, jointed usually near the base: carpels 7–11, long-birostrate.—*Cav. diss.* 1. *t.* 3. *f.* 10; *DC. prod.* 1. *p.* 460; *Wight! cat. n.* 197.—S. acuta, *Wall.! L. n.* 1868. *g.*

This chiefly differs from the preceding species by the broader leaves; but from the West Indian *S. Balbisiana, brachypetala,* and *repanda,* of authors, which seem to form one species, we can point out no satisfactory distinguishing character.

†* 212. (3) S. *orientalis* (Cav.:) suffrutescent: leaves rhomboid or ovate, obtuse, acute or acuminated, toothed, glabrous: stipules linear, as long as the petioles: pedicels axillary, solitary, not quite so long as the petiole: carpels 9–10, obtuse.—*Cav. diss.* 1. *t.* 12. *f.* 1; *DC. prod.* 1. *p.* 461; *Spr. syst.* 3. *p.* 116.

213. (4) S. *scabrida* (W. & A.:) whole plant sprinkled with rigid, simple, or 2–3- (or more) partite hairs: branches without tubercles under the leaves: leaves rhomboid or oblong, lanceolate; both sides green, without tomentum: stipules subulate, striated, ciliated, longer than the petiole: pedicels axillary, solitary, more than half the length of the leaf, 3–4-times as long as the stipules, jointed at the very base: carpels 9–11, bicuspidate.—*Wight! cat. n.* 198.

214. (5) S. *rhomboidea* (Roxb.:) shrubby: branches without tubercles under the leaves: leaves rhomboid-lanceolate, serrated; under side hoary with short tomentum: stipules subulate, slender, longer than the petioles: pedicels more than half the length of the leaf, jointed at the very base, axillary, soli-

Digitized by Google

tary, usually collected into leafy corymbs at the extremity of the branches: carpels 8–11, slightly bicuspidate.—*Roxb. hort. Bengh. p.* 50; *in E. I. C. mus. tab.* 1489; *DC. prod.* 1. *p.* 462; *Spr. syst.* 3. *p.* 117; *Wall.! L. n.* 1863. —S. rhombifolia, *Wall.! L. n.* 1862 *f.* (from H. B. C.)——Negapatam. Coromandel.

Dr Wallich says that Roxburgh's plant is *S. rhombifolia* (distinguished by the long beaks to the carpels); but Roxburgh's figure, and what was cultivated in the Calcutta garden by Roxburgh, agree perfectly with ours. Perhaps, from the similarity of names, Wallich has accidentally confused *S. rhombifolia* and *S. rhomboidea.*

215. (6) S. *retusa* (Linn.:) shrubby: branches without tubercles under the leaves: leaves obovate, retuse (upper ones sometimes only rounded), toothed towards the apex; under side hoary with short tomentum: stipules subulate, longer than the petiole: pedicels axillary, 1-flowered, about as long as the leaves, jointed about the middle: carpels 7–10, birostrate.—*Cav. diss.* 1. *t.* 3. *f.* 4; *diss.* 5. *t.* 131. *f.* 2; *DC. prod.* 1. *p.* 462; *Spr. syst.* 3. *p.* 111; *Roxb. in E. I. C. muss. tab.* 1488; *Wall. L. n.* 1870.—*Rumph. Amb.* 5. *t.* 19; *Rheed. Mal.* 10. *t.* 18.——Malabar; *Rheede.*

216. (7) S. *Philippica* (DC.:) shrubby: branches without tubercles under the leaves: leaves obovate, rounded and toothed towards the apex, cuneate and quite entire at the base, nearly glabrous: stipules subulate, longer than the petiole: pedicels axillary, solitary, about as long as, or longer than, the leaves, jointed above the middle: carpels 8–10, obtuse.—*DC. prod.* 1. *p.* 462; *Spr. syst.* 3. *p.* 117; *Wall. L. n.* 1869; *Wight! cat. n.* 195 (partly).—S. Chinensis, *Retz.; Roxb. hort. Bengh. p.* 97; *in E. I. C. mus. tab.* 342.——Negapatam. Coromandel.

217. (8) S. *alnifolia* (Linn.:) shrubby: branches without tubercles under the leaves: lower leaves roundish-ovate; upper ones obovate or oblong, toothed, slightly cuneate and quite entire at the base, nearly glabrous: pedicels axillary, several together, shorter than the petiole (according to De Candolle; or, according to Roxburgh's figure, several placed on a very short axillary almost leafless branch, the whole raceme much shorter than the leaves): carpels 5–7, bicuspidate.—*DC. prod.* 1. *p.* 461; *Spr. syst.* 3. *p.* 111; *Roxb. in E. I. C. mus. tab.* 343; *Wall. L. n.* 1873.—*Dill. Elth. t.* 172. *f.* 211; *Pluk. t.* 132. *f.* 2? (bad).——Coromandel; *Roxburgh; Heyne.*

A species we have not seen. Roxburgh says that "the anthers are very irritable to the touch, especially before the expansion of the corolla."

218. (9) S. *alba* (Linn.:) shrubby: branches with 1 or 2 prickly tubercles below the leaves: leaves cordate-ovate, or obovate, or oblong, obtuse, bluntly serrated, hoary beneath; pedicels jointed near the flower, solitary, as long as the petioles, or several on a short axillary nearly leafless young branch: carpels 5, birostrate.—α; leaves oblong, *Wight! cat. n.* 196.—S. alba, *DC. prod.* 1. *p.* 460; *Spr. syst.* 3. *p.* 112.—S. spinosa, *Linn.* (as to the E. I. plants).—*Pluk. t.* 9. *f.* 3.—β; leaves cuneate-obovate.—S. retusa, *Wight! cat. n.* 195. *a.* —γ; leaves cordate, roundish-ovate.—*Wight! cat. n.* 958.—S. glandulosa, *Roxb. in E. I. C. mus. tab.* 344.——Coromandel; *Roxburgh; Rottler; Wight.*

219. (10) S. *cordifolia* (Linn.!:) shrubby: leaves cordate, roundish or ovate, obtuse or scarcely acute, bluntly serrated, velvety or tomentose: pedicels jointed near the flower, axillary, solitary, from twice as short to twice as long as the petiole, occasionally arranged in very short axillary almost leafless young branches: carpels 9–10, with two setaceous downward-pointing-hairy beaks as long as the carpel itself.—*Roxb. in E. I. C. mus. tab.* 348; *DC. prod.* 1. *p.* 464; *Spr. syst.* 3. *p.* 112; *Wall.! L. n.* 1849; *Wight! cat. n.* 194.—S. herbacea, *Cav. diss.* 1. *p.* 19. *t.* 13. *f.* 1; *DC. prod.* 1. *p.* 464; *Spr. syst.* 3. *p.* 112.—S. rotundifolia, *Cav.! diss.* 1. *p.* 20. *t.* 3. *f.* 6; *diss.* 6. *t.* 194. *f.* 2;

Digitized by Google

DC. prod. 1. *p.* 464; *Spr. syst.* 3. *p.* 113.—*Rheed. Mal.* 10. *t.* 54; *Pluk. t.* 131. *f.* 2. *and t.* 356. *f.* 1 (bad).

A very variable species in the shape of the leaves, but easily recognised by the long beaks to the carpels. Like most others of the genus, its duration is perennial, although flowering the first year, and therefore sometimes erroneously described as annual.

†220. (11) S. *radicans* (Cav.:) suffrutescent, prostrate: leaves roundish cordate, acute, hairy, serrated: pedicels axillary, solitary, 1-flowered, longer than the petiole: carpels 5, not rostrate.—*Cav. diss.* 1. *p.* 8; *DC. prod.* 1. *p.* 463; *Spr. syst.* 3. *p.* 120.—*Rheed. Mal.* 10. *t.* 69.——Malabar.

An extremely doubtful species, known yet only by Rheede's bad figure; the serratures of the leaves are represented each tipped with a hair, which often happens in other species with hairy leaves. On the whole, it is closely allied to the following.

221. (12) S. *Mysorensis* (Herb. Madr.:) herbaceous, covered all over with glutinous hairs: leaves cordate-ovate, acuminated, coarsely toothed; under side more or less velvety or tomentose: pedicels jointed below the flower, axillary, scarcely so long as the petioles, accompanied by an axillary almost leafless raceme, usually shorter than the leaves: carpels 5, bicuspidate, somewhat thickened and tuberculated at the margins, slightly carinate on the back.—*Wight! cat. n.* 183.—S. hirta, *Wall.! L. n.* 1855 (not *Lam.*)—S. glutinosa, *Roxb. hort. Bengh. p.* 97; *in E. I. C. mus. tab.* 347 (not *Cav.*)—S. olens, *Ham.! in Wall. L. n.* 1874.—S. tenax, *Ham.!*——Coromandel; *Roxburgh.* Mysore; *Heyne.*

222. (13) S. *urticæfolia* (W. & A.:) suffrutescent, erect, covered all over with a short glutinous pubescence, mixed with other longer and more rigid hairs: leaves on long petioles, cordate, roundish or ovate, acuminated, serrated; serratures rounded and again serrated: pedicels arranged in an axillary almost leafless corymb, usually much shorter than the petiole, or rarely about as long: calyx hairy: carpels 5, bicuspidate.—*Wight! cat. n.* 182.—S. nervosa, *Wall. ! L. n.* 1853. *e.*——Trichinopoly.

We can scarcely believe that it is only a variety of *S. Mysorensis*, but that is the only species with which it can be confounded. It is allied also to *S. urens* and *S. verticillata*, both from the New World. *S. nervosa*, DC., and Wallich's L. n. 1853. *a.* and *c.* (only), is from St Domingo, although cultivated in the Calcutta garden.

223. (14) S. *humilis* (Willd.:) herbaceous, slender, diffuse: leaves roundish, cordate, acute or shortly acuminated, serrated, sprinkled with stellate longish hairs: pedicels jointed above the middle, clothed with horizontal rigid hairs, slender, axillary, solitary, and rather shorter than the leaves; or arranged in longish lax axillary racemes, with small leaves shorter than the pedicels: calyx hairy: carpels 5, not beaked, obtuse or sometimes slightly bicuspidate.—*DC. prod.* 1. *p.* 463 (*α* and *β*); *Spr. syst.* 3. *p.* 120; *Wall.! L. n.* 1854; *Wight! cat. n.* 186.—S. pilosa, *Retz; Roxb. in E. I. C. mus. tab.* 345.—S. unilocularis, *L'Her. st. p.* 117. *t.* 56. *(bis).*—S. multicaulis, *Cav. diss.* 1. *t.* 1. *f.* 6; *DC. prod.* 1. *p.* 463; *Spr. syst.* 3. *p.* 120.—S. nervosa, *Wall.! L. n.* 1853. *b.* (not *DC.*)—*Pluk. t.* 132. *f.* 3.——Common.

We have not seen any specimens agreeing with the *var. γ.* of Willdenow and De Candolle, or *S veronicæfolia*, Lam.; so that we suspect either some mistake in the description, or that it is a species not found in India. We do not, however, know Wallich's No. 1853. *d*, so that it may possibly be the plant in question, although we rather suppose it is a state of the present species. Plukenet's figure represents pretty accurately the axillary leafy raceme of *S. humilis*. As to *S. multicaulis*, Cavanilles and Lamarck only say that it is tomentose, but De Candolle adds that "the whole plant is hispid with long hairs," so that it is not a distinct species.

Digitized by Google

ORDER XXII. BOMBACEÆ. *Kunth.*

Calyx gamosepalous, campanulate or cylindrical, truncate or quinquepartite, with a few minute bracteas on the outside. Petals hypogynous, 5, regular, or none: æstivation twisted. Stamens hypogynous, 5, 10, 15, or more: filaments cohering at the base into a tube, which is soldered to the tube of the petals, divided above into 5 parcels, each of which bears 1 or more anthers, intermixed sometimes with barren filaments: anthers 1-celled, linear. Ovarium of 5 (rarely 10) carpels, either strictly cohering or partly distinct: styles as many as the carpels, free, or more or less cohering. Placentæ in the axis. Fruit various, capsular, or indehiscent, usually with 5 valves and loculicide. Seeds often inclosed in a woolly or pulpy covering; sometimes with a fleshy albumen and flat cotyledons; sometimes exalbuminous with wrinkled or convolute cotyledons.—Leaves alternate, with stipules. Pubescence on the herbaceous parts stellate.

I. HELICTERES. *Linn.*; *Lam. ill. t.* 735; *Gærtn. fr. t.* 64.

Calyx tubular, somewhat 5-cleft. Petals 5, ligulate-unguiculate, slightly toothed at the apex. Stamens 5–10–15, united into a long column that is urceolate and multifid at the apex, the fertile ones mixed with some hair-like sterile filaments. Ovarium on a long stalk. Styles 5, united at the base. Carpels 5, 1-celled, many-seeded, dehiscing on the inside, sometimes straight, usually twisted together spirally. Seeds without albumen: cotyledons spirally convolute.—Shrubs and trees, usually clothed with stellate tomentum. Leaves simple, unequally cordate. Peduncles axillary, few-flowered.

224. (1) H. *Isora* (Linn.:) leaves broad, slightly cordate, roundish-obovate, suddenly and shortly acuminated, serrate-toothed; upper side scabrous, under tomentose, or rarely almost glabrous: pedicels 2–4 together, forming a short compact almost sessile axillary corymb: petals reflexed: stamens 10: fruit cylindrical, acuminated, spirally twisted, pubescent.—α; under side of leaves tomentose, *Wight! cat. n.* 224. *a.*—H. Isora, *Linn.*; *DC. prod.* 1. *p.* 475; *Spr. syst.* 3. *p.* 80; *Roxb.!*; *Wall.! L. n.* 1179.—H. Roxburghii, *G. Don in Mill. dict.*—*Rheed. Mal.* 6. *t.* 30; *Rumph. Amb.* 7. *t.* 17. *f.* 1; *Pluk. t.* 245. *f.* 2.—β; under side of leaves nearly glabrous.—*Wight! cat. n.* 224. *b.*—H. Isora? *Wall.! L. n.* 1179. *g.*—H. macrophylla, *Herb. Wight.*——Common throughout the low hills of the Peninsula.

† * 225. (2) H. *longifolia* (Wall. L. n. 2687.)—H. Carthagenensis, *Herb. Madr.*

II. ADANSONIA, *Linn.*; *Lam. ill. t.* 588; *Gærtn. fr. t.* 135.

Calyx without bracteoles, deciduous, 5-partite. Petals 5, united almost to the middle. Urceolus of stamens dilated and expanded upwards. Style very long. Stigmas many, stellate. Capsule woody, indehiscent, 10-celled; cells many-seeded, filled with a farinaceous pulp enveloping the seeds.—A spreading large tree. Trunk thick, spongy. Leaves digitate, with 3 leaflets on the young plant, and 5–7 on the adult. Flowers on long axillary solitary pedicels, large, white, with purplish anthers.

Digitized by Google

*226. (1) A. *digitata* (Linn.)—*DC. prod.* 1. *p.* 478; *Spr. syst.* 3. *p.* 124; *Roxb. in E. I. C. mus. tab.* 969; *Wall. L. n.* 1838; *Wight! cat. n.* 227.—— Naturalised at Samulcottah, Madras, Negapatam, and probably elsewhere in the Peninsula.

III. BOMBAX. *Linn.*

Calyx without bracteoles, campanulate, unequally 2–5 lobed, or truncate and 5-toothed. Petals 5, united together and somewhat connected at the base with the column of stamens. Stamens numerous, monadelphous at the base, free towards the apex. Anthers inserted by the middle, reniform or oblong, opening above by a transverse cleft. Capsule large, woody, 5-celled, 5-valved. Cells many-seeded. Seeds with albumen, imbedded in silky cotton.—Large trees with soft spongy wood. Leaves palmate. Flowers large, scarlet or white, usually springing laterally from the trunk or branches either singly or several together.

227. (1) B. *Malabaricum* (DC.:) trunk prickly: leaflets 5–7, quite entire, acuminated at both ends: fruit oblong, obtuse.—*DC. prod.* 1. *p.* 479; *Spr. syst.* 3. *p.* 124; *Wall.! L. n.* 1840; *Wight! cat. n.* 225.—B. heptaphyllum, *Cav.; Roxb. hort. Bengh. p.* 50; *Cor.* 3. *t.* 247; *in E. I. C. mus. tab.* 1483.—B. ceiba, *Burm. fl. Ind.* (excl. many syn.)—Gossampinus rubra, *Ham. in Linn. Soc. Trans.* 15. *p.* 128.—*Rheed. Mal.* 3. *t.* 52.——Courtallum. Malabar.

IV. ERIODENDRON. *DC.*

Calyx without bracteoles, irregularly 5-lobed; lobes usually in pairs. Petals 5, united at the base with each other, and with the column of stamens. Filaments joined together into a short tube at the base, but divided upwards into 5 filiform bundles, each bearing 2–3 linear or serpentinely bent (anfractuose) anthers, the latter combined and resembling a simple anther. Style crowned by a 5–6-cleft stigma. Capsule and seeds as in Bombax.—Appearance that of Bombax.

228. (1) E. *anfractuosum* (DC.:) trunk at the base prickly: leaflets 5–8, quite entire or serrulated towards the point, lanceolate, mucronate, glaucous beneath: anthers versatile, anfractuose.—*DC. prod.* 1. *p.* 479; *Wall.! L. n.* 1839; *Wight! cat. n.* 226.—Bombax pentandrum, *Linn.; Roxb. in E. I. C. mus. tab.* 1484; *Lam. ill. t.* 587.—B. orientale, *Spr. syst.* 3. *p.* 124.—Ceiba pentandra, *Gærtn. fr. t.* 133.—Gossampinus alba, *Ham. in Linn. Soc. Trans.* 15. *p.* 126.—*Rheed. Mal.* 3. *t.* 49–51; *Rumph. Amb.* 1. *t.* 80.

ORDER XXIII.—BYTTNERIACEÆ. *R. Brown.*

Calyx naked, or with an involucel or bracteoles: sepals 5, more or less united at the base: æstivation valvate. Petals hypogynous, 5 or none, often saccate at the base and variously lengthened at the apex: æstivation convolute. Stamens hypogynous, equal to the number of the petals, or some multiple of them, more or less monadelphous, some of them often sterile: anthers bilocular, extrorse. Ovarium of 5 (rarely fewer) carpels, that are more or less united: styles as many as the carpels, distinct or united: ovules ascending, 2–3 or many in each carpel. Capsule 3–5-celled, 3–5-valved. Seeds with a strophiolate apex,

Digitized by Google

often winged. Albumen oily, or fleshy, rarely wanting. Embryo usually straight: radicle inferior: cotyledons foliaceous, flat and plaited, or rolled round the plumula; or, in the exalbuminous seeds, very thick. —Trees or shrubs. Pubescence often stellate. Leaves alternate, simple, exstipulate.

TRIBE I. STERCULIEÆ. *Kunth.*

Flowers by abortion frequently unisexual. Calyx without bracteoles, 5-lobed, deciduous. Petals none. Stamens as many, or twice, thrice, or four times as many as the lobes of the calyx, shortly monadelphous at the base. Ovarium often stalked, consisting of 5 distinct carpels. Albumen oily or none. Embryo erect: cotyledons flat and foliaceous in the albuminose seeds, very thick and unequal in the exalbuminose: radicle ovate, short.—Leaves entire, lobed, or digitate; petioles with a swelling at both their base and apex.

I. STERCULIA. *Linn.; Lam. ill. t.* 736.

Calyx 5-lobed, somewhat coriaceous. Stamens monadelphous, united into a short urceolus which is either sessile or at the extremity of a solid staminal column: anthers 10, 15, or 20, in a single or double row, solitary or in threes. Ovary stalked or sessile. Carpels follicular, 5, distinct, 1-celled, 1- or many-seeded, dehiscing on the inside towards the top. Seeds with an oily albumen: cotyledons flat, foliaceous, equal.—Trees with simple or compound leaves, and axillary panicles or racemes of flowers.*

229. (1) S. *Balanghas* (Linn.:) leaves elliptic-oblong, bluntish, rounded at the base, entire, nearly glabrous: flowers panicled: calyx campanulate; segments long, linear, cohering at the apex: fruit stalked; carpels ovate or obovate, many-seeded.—*DC. prod.* 1. *p.* 482; *Spr. syst.* 3. *p.* 82; *Roxb. in E. I. C. mus. tab.* 991; *Wall.! L. n.* 1118; *Wight! cat. n.* 229.—*Rheed. Mal.* 1. *t.* 49.

230. (2) S. *guttata* (Roxb.:) leaves between broadly-ovate and oblong, obtuse or with a longish sudden acumination, entire, prominently nerved and veined beneath; upper side shining, under young leaves densely pubescent: racemes somewhat fascicled, nearly simple: pedicels short: calyx deeply 5-cleft, tomentose; segments lanceolate, distinct: ovarium stalked: carpels obovate.—*Roxb. hort. Bengh. p.* 50; *DC. prod.* 1. *p.* 482; *Spr. syst.* 3. *p.* 82; *Wall.! L. n.* 1127; *Wight! cat. n.* 230.—*Rheed. Mal.* 4. *t.* 61.

†*231. (3) S. *macrophylla* (Ventn.:) leaves roundish-cordate, entire, thick, under side tomentose: carpels ovate, quite glabrous within, 2-seeded. —*DC. prod.* 1. *p.* 483; *Spr. syst.* 3. *p.* 82.——Most probably from what were formerly the French possessions in the Peninsula.

A species involved in great doubt, and perhaps a mere variety of the following.

232. (4) S. *populifolia* (Roxb.:) leaves roundish-cordate, acuminated, entire, membranaceous, glabrous: racemes axillary, peduncled, branched, shorter than the leaves: calyx-segments linear, elongated, revolute, obtuse: ovarium stalked; ovules numerous in each cell: carpels ovate, ventricose, terminated by a very obtuse cultriform (like a pruning-knife) wing, long-stalked, glabrous, villous within.—*Roxb. hort. Bengh. p.* 50; *Wall. pl. Asiat. rar.* 1. *p.* 3. *t.* 3; *L. n.* 1128.—S. populifolia, *β. DC. prod.* 1. *p.* 483.—— Coromandel: *Heyne.*

Wallich has pointed out that De Candolle's var. *β*, is a distinct species, which he proposes to call *S. Candollii.* We have not seen either.

* Dr Hooker has kindly shown us specimens, and pointed out to us that *Lunanea*, DC. prod. 2. p. 92, is a species of *Sterculia:* indeed, it is surprising that the figure in Sloane (Jam. 2. t. 184), and the name *Cola*, by which it is known to the Negroes, had not long since suggested its affinity to *S. acuminata*, Beauv., like which it is a native of Africa: it appears to be *S. macrocarpa*, G. Don.

Digitized by Google

233. (5) S. *colorata* (Roxb.:) leaves glabrous, palmately 5-lobed, lobes acuminated: calyx cylindrical-clavate: carpels oblong, membranaceous, glabrous, long-stalked.—*Roxb. Cor.* 1. *t.* 25; *DC. prod.* 1. *p.* 483; *Spr. syst.* 3. *p.* 83; *Wall.! L. n.* 1119; *Wight! cat. n.* 228.——Courtallum.

Calyx and carpels reddish orange-coloured.

234. (6) S. *urens* (Roxb.:) leaves palmately 5-lobed, softly velvety beneath; lobes acuminated, entire: calyx campanulate: carpels ovate, hispid with dense patent rigid bristly hairs, pubescent within: seeds several in each carpel.—*Roxb. Cor.* 1. *t.* 24; *DC. prod.* 1. *p.* 483; *Spr. syst.* 3. *p.* 83; *Wall.! L. n.* 1120; *Wight! cat. n.* 233.——Courtallum.

235. (7) S. *villosa* (Roxb.:) leaves deeply and palmately 5–7-lobed; under side softly velvety; lobes acuminated, deeply toothed or lobed: calyx 5-partite, patent: carpels coriaceous, rough with a stellate pubescence.—*Roxb.! hort. Bengh. p.* 50; *in E. I. C. mus. tab.* 1196; *Sm. in Rees' Cycl.; DC. prod.* 1. *p.* 483; *Spr. syst.* 3. *p.* 83; *Wall. L. n.* 1136.——Coromandel.

236. (8) S. *fœtida* (Linn.:) leaves compound, peltate; leaflets 7–9-oblong, lanceolate, acuminated; young ones slightly pubescent, adult ones glabrous: flowers panicled: calyx deeply divided, segments patent, lanceolate, nearly glabrous on the outside, slightly velvety within: anthers 15: carpels oblong, many-seeded.—*DC. prod.* 1. *p.* 483; *Spr. syst.* 3. *p.* 83; *Wall.! L. n.* 1137; *Wight! cat. n.* 231.—*Rumph. Amb.* 3. *t.* 107.

II. HERITIERA. *Ait.*

Calyx 5-toothed. Stamens in the male flowers 5–10, with the filaments joined into a tube; anthers sessile on the top of the tube: in the bisexual flowers anthers 10, sessile, two between each carpel. Carpels 5, each with 1 style, containing few ovules; at length resembling coriaceous drupes, indehiscent, carinate, 1-seeded by abortion. Albumen none. Embryo very thick; cotyledons fleshy, unequal: radicle ovate, acuminated, pointing away from the suture of the carpel; plumule 2-leaved.—Trees with simple alternate entire leaves, the under side of which are covered with minute silvery scales. Flowers panicled, small, red.

237. (1) H. *littoralis* (Ait.:) leaves oval, acute or bluntish, rounded at the base, simply veined: panicles axillary: carpels marked upwards by a longitudinal nerve.—*DC. prod.* 1. *p.* 484; *Spr. syst.* 3. *p.* 70.—H. fomes, *Wall. L. n.* 1139. *f.*—Balanopteris Tothila, *Gærtn. fr. t.* 99.—*Rheed. Mal.* 6. *t.* 21.

Of this we have not seen specimens. We exclude from the synonyms that of Rumph. Amb. 3. t. 63, upon which Dr F. Buchanan Hamilton makes the following remark: "The drawing and description of the fruit no doubt represent the *H. minor* of the Encycl. Meth., of which I published in Syme's Journ. to Ava an account under the name of *H. Fomes*, and which is the Balanopteris minor of Gærtner; the description of the flower evidently refers to a *Niota*, which in both Ava and Bengal is confounded with the *Heritiera* under the same name, and which I call *N. polyandra*." Thus, then, *H. Fomes*, Ham. and Willd., and *H. minor*, Lam. and Roxb. (or the *Sterculia argentea*, Roxb. in E. I. C. mus. tab. 1197), are identical, and probably all Wall. L. n. 1139 excepting *f.* As to the *Niota polyandra*, it has lanceolate attenuated leaves, and is *H. attenuata*, Wall. L. n. 1140.

TRIBE II.—KLEINHOVIEÆ. *Arn.*

Flowers bisexual. Calyx 5-partite, without an involucel. Petals 5, concave, cucullate at the apex. Stamens united into a long tube, urceolate and pentadelphous at its apex; without any intermediate sterile ones. Ovarium on a long stalk, 5-celled; cells 4-ovuled. Seeds exalbuminose: cotyledons spirally convolute around the plumule.—Tree. Leaves cordate, broad, acuminated, entire. Flowers racemose, purplish.

Digitized by Google

III. KLEINHOVIA. *Linn.; Lam. ill. t. f.* 734; *Gærtn. fr. t.* 137.

Petals 5, the one, at the opposite side from the curvature of the stamens, much broader than the others. Column of stamens declinate, pentadelphous at the apex, each bundle opposite to a petal and bearing on the outside three anthers. Style one. Stigma slightly crenated. Capsule inflated, turbinate, 5-angled, 5-celled, 5-seeded. The other characters as in the tribe.

238. (1) K. *Hospita* (Linn.:)—*DC. Prod.* 1. *p.* 488; *Spr. syst.* 3. *p.* 83; *Roxb. in E. I. C. mus. tab.* 1435; *Wall.! L. n.* 1152; *Wight! cat. n.* 232.—*Rumph. Amb.* 3. *t.* 113.

TRIBE III.—BYTTNERIEÆ. *DC.*

Flowers bisexual. Calyx 5-partite or 5-sepaled, without an involucel. Petals frequently concave and vaulted at the base, expanded at the apex into a strap-shaped appendage. Stamens 10–30, or more; the five that are opposite to the sepals sterile and strap-shaped; the others, opposite to the petals, either solitary or pentadelphous, the bundles rarely bearing only 1 anther. Ovarium sessile, 5-celled; cells usually 2-ovuled. Seeds sometimes exalbuminose with thick cotyledons; sometimes albuminose with foliaceous, plane, or convolute cotyledons.—Trees, shrubs, or very rarely herbaceous plants. Leaves alternate, entire, or sometimes cut. Stipules twin. Peduncles axillary, opposite to the leaves, and terminal, 1- or many-flowered.

IV. THEOBROMA. *Juss.*

Calyx 5-sepaled. Petals 5, vaulted at the base, ligulate and strap-shaped above. Stamens 15, connected into an urceolus at the base; sterile filaments 5, alternate with the petals, linear-subulate, elongated; fertile ones short, united into 5 filaments, each opposite to a petal and bearing two anthers. Style 5-cleft at the apex: stigmas simple. Fruit indehiscent, between coriaceous and woody, ovate-oblong, 5-celled. Seeds imbedded in a buttery pulp. Albumen none. Cotyledons thick, wrinkled, full of oil.—Small trees. Leaves large, entire. Peduncles axillary, lateral after the fall of the leaves; sometimes simple 1-flowered and fascicled, sometimes branched and many-flowered.

* 239. (1) T. *Cacao* (Linn.:) leaves elliptic-oblong, acuminated, quite entire, glabrous; the midrib pubescent on the upper side: fruit oblong, obtuse, with 10 elevated wrinkled ribs.—*DC. prod.* 1. *p.* 484; *Spr. syst.* 3. *p.* 334; *Wight! cat. n.* 238.—Cacao sativa, *Lam. ill. t.* 635.—C. minus, *Gært. fr. t.* 122. *f.* 1.

V. GUAZUMA. *Plum.; Juss.; Lam. ill. t.* 637.

Calyx 5-sepaled, deciduous, the sepals sometimes united two or three together. Petals 5, concave below, linear-ligulate and deeply bifid at the apex. Stamens very slightly connected at the base: sterile ones 5, lanceolate: fertile ones united into five trifid filaments, each opposite to a petal, and bearing three anthers. Styles 5, connivent. Stigmas simple. Fruit indehiscent, woody, externally muricated with club-shaped variously-connected tubercles, 5-celled, polyspermous. Seeds ovate-roundish. Albumen very thin, fleshy. Cotyledons plaited.—Trees with stellate pubescence. Leaves entire. Peduncles axillary and terminal, somewhat dichotomously branched, many-flowered.

* 240. (1) G. *tomentosa* (H. B. K.:) leaves ovate-oblong, acuminated, cordate and unequal at the base, toothed; upper side stellately-puberulous, un-

Digitized by Google

der with a stellate white tomentum.—*DC. prod.* 1. *p.* 485; *Wight! cat. n.* 235. —G. ulmifolia, *Wall.! L. n.* 1141.—Bubroma tomentosum, *Spr. syst.* 3. *p.* 332.

VI. ABROMA. *Linn.; Lam. ill. t.* 636, 637; *Gærtn. fr. t.* 64.

Calyx 5-partite. Petals 5, saccate at the base, with a large oblong deciduous unguiculate appendage. Stamens connected into an urceolus at the base; 5 sterile, petaloid, curved outwards; fertile ones united into 5 trifid filaments, each bearing 3 anthers. Styles 5. Capsule ovoid, 5-celled, with 5 prominent angles; each cell dehiscing above, many-seeded. Seeds with an arillus. Albumen fleshy, transversely flexuose.—Small trees, with stellate pubescence. Leaves cordate, angled or lobed.

* 241. (1) A. *augusta* (Linn.:) branches velvety, not muricated; adult leaves ovate-oblong, acuminated, serrulated, under side tomentose or more or less scabrous with stellate pubescence; lower leaves roundish-cordate, 3–5-angled; wings of the fruit truncated at the apex, with the exterior angle somewhat acute.—*DC. prod.* 1. *p.* 485; *Spr. syst.* 3. *p.* 333; *Roxb. in E. I. C. mus. tab.* 415; *Wall. L. n.* 1142.—A. angulata, *Lam. ill. t.* 636, 637.—A. Wheeleri, *Koen.*——Interior of the Peninsula: *Roxburgh.*

VII. BYTTNERIA. *Læfl.; Linn.*

Calyx 5-sepaled, deciduous. Petals 5, at the base concave connivent, produced upwards into a kind of strap-like appendage. Stamens united into a 5-cleft urceolus: anthers 5, solitary, nearly sessile between the sterile stamens (lobes of the urceolus), opposite to the petals. Ovarium 5-celled: ovules 2 in each cell. Style 1. Stigma obsoletely 5-lobed. Capsule 5-coccous, muricate and slightly echinate: cocci 1-seeded, dehiscing by the inner angle.—Shrubs or rarely herbaceous plants, usually prickly. Leaves entire. Peduncles 1-flowered, axillary, two or more together; or the flowers in pedunculate umbels, axillary or opposite to the leaves.

The genus *Rulingia* of Brown appears distinct: in it the sterile stamens are scarcely at all united with the fertile ones, and are petaloid, instead of being reduced to mere lobes of an urceolus: the fertile ones are elongated. *Asclepias armata* (Spr. syst. 1. p. 849) is *Byttneria carthagenensis*, Jacq.

242. (1) B. *herbacea* (Roxb.:) stem herbaceous, without prickles; leaves not glandular, toothed, ovate, acuminated, cordate, rounded or cuneate at the base: sepals linear-lanceolate, reflexed: ligulate production of the petals subulate, erect, about as long as the calyx: free part of the antheriferous filaments very short, recurved: lobes of the urceolus (sterile stamens) ovate.—*Roxb. Cor.* 1. *t.* 29; *Roxb. fl. Ind.* 1. *p.* 619; *Roxb. et Wall. fl. Ind.* 2. *p.* 382; *DC. prod.* 1. *p.* 486 (charac. bad); *Spr. syst.* 1. *p.* 790; *Wall. L. n.* 1146; *Wight! cat. n.* 237.—Commersonia herbacea, *G. Don.*——Circars; *Roxburgh.* Vellore; *Wight.*

TRIBE IV.—HERMANNIEÆ. *Kunth.*

Flowers unisexual. Calyx 5-lobed, persistent, either naked or with an involucel. Petals 5, spirally twisted in æstivation. Stamens 5, monadelphous, all fertile, opposite to the petals. Carpels united into a single fruit. Albumen between fleshy and mealy. Embryo included: radicle inferior, ovate: cotyledons flat, leafy, entire.—Shrubs or herbaceous plants. Leaves alternate, simple, or variously cut. Stipules 2, adhering to the petioles. Peduncles axillary, or opposite to the leaves, or terminal, with 1, 3, or many flowers, which are usually in umbels.

VIII. RIEDLEIA. *Ventn.*

Calyx 5-cleft, sometimes with 3 bracteoles. Petals 5, equal, attached by their claws to the staminal tube. Stamens 5, united at the base and some-

Digitized by Google

times to the apex. Ovarium 5-celled, with 2 superposed ovules in each cell. Styles 5, distinct, or united at the base. Stigmas club-shaped. Capsule nearly globose, 5-coccous; cocci 1-2-seeded. Seeds oblong, not winged. Embryo straight.—Herbaceous or shrubby plants with stellate pubescence. Leaves alternate, entire or slightly lobed, serrated. Flowers terminal and opposite to the leaves, capitate, umbellate, verticillate, spiked, racemose, or panicled, white or yellow. Bracteoles at the base of the pedicels.

243. (1) R. *truncata* (DC.:) shrubby: leaves cuneiform, truncated and toothed at the apex; upper side glabrous, under hoary with stellate pubescence: flowers solitary, or two or three together, at the extremity of the branches: fruit flattened at the top.—*DC. prod.* 1. *p.* 491; *Wight! cat. n.* 248.—Melochia truncata, *Willd. sp.* 3. *p.* 601; *Spr. syst.* 3. *p.* 29.—Sida retusa, *Roxb. in E. I. C. mus. tab.* 341.—S. cuneifolia, *Roxb. hort. Bengh. p.* 50.——Coromandel, common.

Specimens of this were sent to Dr Wallich, but we do not observe it in his List.

244. (2) R. *supina* (DC.:) stems herbaceous, prostrate: leaves broadly ovate, obtuse or slightly cordate at the base, serrated, glabrous with the midrib sometimes pubescent: flowers few together, sessile, terminal and capitate, in the axils of the two or three uppermost leaves: fruit globose.—*DC. prod.* 1. *p.* 491; *Wight! cat. n.* 246.—Melochia supina, *Linn.*—Visenia supina, *Spr. syst.* 3. *p.* 31.—*Pluk. t.* 132. *f.* 4 (good).——Coromandel.

In conformity with other writers, we have retained this and the two following as distinct: the materials at present before us are not very good, but they lead to a suspicion, which we trust ere long to be able to decide upon, that all the three are mere variations of one and the same species.

245. (3) R. *corchorifolia* (DC.:) stems herbaceous, erect: leaves ovate, sometimes slightly lobed, rounded or cordate at the base, serrated, glabrous, or pubescent on the midrib: flowers terminal or nearly so, in very short dense spikes arranged in a sessile capitulus: fruit globose.—*DC. prod.* 1. *p.* 491; *Wight! cat. n.* 245 (partly).—Melochia corchorifolia, *Linn.; Wall. L. n.* 1196 (partly).—Visenia corchorifolia, *Spr. syst.* 3. *p.* 30.—Mougeotia corchorifolia, *Kunth.*—*Pluk. t.* 44. *f.* 5 (good); *Dill. Elth. t.* 176. *f.* 217; *Rheed. Mal.* 9. *t.* 73 (bad).——Coromandel and Malabar, common.

246. (4) R. *concatenata* (DC.:) stems herbaceous, erect: leaves ovate-lanceolate, sometimes slightly lobed, obtuse or cordate at the base, serrated, glabrous, or pubescent on the midrib: flowers arranged in spikes, usually becoming elongated in fruit, and placed several together at the extremity or nearly so of the branches: fruit globose.—*DC. prod.* 1. *p.* 492; *Wight! cat. n.* 245 (partly), *and* 247?—R. radiata, *Blume.*—Melochia concatenata, *Linn.; Wall. L. n.* 1197.—M. corchorifolia, *Wall.! L. n.* 1196. *i.*—Visenia concatenata, *Spr. syst.* 3. *p.* 31.—*Pluk. t.* 9. *f.* 5 (good).——Coromandel.

By an erroneous synonym in Plukenet, this has been said to be also a native of the West Indies. Dr Wight's, No. 247, has the spikes scarcely enough elongated, and is quite intermediate between this and the last species.

IX. WALTHERIA. *Linn.; Lam. ill. t.* 570.

Calyx 5-cleft, persistent, with a 3-leaved lateral deciduous involucel. Petals 5, equal, attached by their claws to the staminal column. Filaments united into a nearly entire, or 5-cleft tube. Ovarium oblique, 1-celled (by the obliteration of four cells): ovules 2, superposed. Style single, slightly lateral. Stigma penicillate. Capsule consisting of 1 coccus, nearly globose, membranaceous, 1-seeded, 2-valved. Embryo in the axis of a fleshy albumen.—Herbaceous plants, shrubs, or little trees, with stellate pubescence.

Digitized by Google

Leaves entire, serrated. Flowers yellow, axillary and terminal, capitately or spicately conglomerated, with many interposed bracteoles.

247. (1) W. *Indica* (Linn.:) leaves ovate, oblong, or lanceolate-oblong, rounded or slightly cordate at the base, plicate, serrated, more or less tomentose on both sides: heads of flowers terminal or axillary, sessile or pedunculated, sometimes elongated into an interrupted almost leafless axillary spike. —*DC. prod.* 1. *p.* 493; *Spr. syst.* 3. *p.* 31; *Wall.! L. n.* 1194; *Wight! cat. n.* 243.—W. americana, *Linn.*; *DC. prod.* 1. *p.* 492; *Spr. l. c.*—W. elliptica, *Cav.*; *DC. prod.* 1. *p.* 493; *Spr. l. c.*; *Wall. L. n.* 1195.—W. microphylla, *Cav.*; *DC. l. c.*; *Spr. l. c.*—*Pluk. t.* 150. *f.* 5. *and* 6; *Burm. Zeyl. t.* 68.

A very common and variable plant; so that, in addition to the above synonyms, we feel certain that *W. angustifolia*, Linn. and H. B. K., *W. corchorifolia*, Pers., *W. ferruginea*, St Hil., *W. lanata*, St Hil., *W. erioclada*, DC., *W. ovata*, Cav., and *W. gracilis*, St Hil., are mere forms of the same species, arising from local circumstances. When the plant is broken or injured by cattle, it sometimes pushes out numerous small leaved branches, constituting then *W. microphylla*, Cav. Some specimens are procumbent, others erect; some arborescent, others suffruticose. In some the leaves are orbicular, in others ovate, and they are usually tomentose, but sometimes nearly glabrous; whence it is not improbable that *W. glabra*, Poir., *W. glabriuscula*, St. Hil., and some others must be yet added to swell the already formidable list of synonyms we have adduced. The character above given of the inflorescence exhibits the *appearance;* the following will more clearly shew its *real* structure:—Flowers several together, axillary, nearly sessile, usually arranged in axillary almost leafless branchlets that are generally very short *(capituli subsessiles vel pedunculati)*, but sometimes elongated *(flores conglomerato-spicati)*.

TRIBE V.—DOMBEYACEÆ. *Kunth.*

Calyx usually with an involucel, 5-partite or rarely 5-lobed. Petals 5, flat, rather large, unequal-sided, convolute in æstivation. Stamens some multiple of the number of petals, in a single row, monadelphous, sometimes all fertile, but usually 5 of them sterile and filiform or strap-shaped. Styles 2, 3, 5, or 10, distinct, or united together. Ovules 2, placed side-by-side, or several in two rows in each cell of the ovarium. Embryo straight, usually in the axis of a fleshy albumen. Cotyledons leafy, often bifid, crumpled or flat.

X. PENTAPETES. *Linn.*; *Lam. ill. t.* 576. *f.* 1.

Calyx deciduous 5-partite, surrounded by a 3-leaved unilateral involucel. Petals 5, deciduous. Stamens 20; 5 sterile, strap-shaped; 15 fertile, placed by threes between each of the sterile ones. Style incrassated upwards, 5-furrowed, with 5 points or stigmas. Capsule 5-celled, 5-valved, many-seeded. Seeds not winged.——Annual plants with axillary few-flowered peduncles.

248. (1) P. *phœnicea* (Linn.)—*DC. prod.* 1. *p.* 498; *Spr. syst.* 3. *p.* 79; *Wall.! L. n.* 1157; *Wight! cat. n.* 234.—P. angustifolia, *Blum.*—Dombeya phœnicea, *Cav. diss.* 3. *t.* 43. *f.* 1.—*Pluk. t.* 255. *f.* 3; *t.* 126. *f.* 4; *Rumph. Amb.* 5. *t.* 100. *f.* 1; *Rheed. Mal.* 10. *t.* 1.

Leaves linear-lanceolate, hastate, or rounded and slightly cordate at the base, serrated. Flowers 1–2, axillary, drooping, red.—We exclude from the genus *Brotera ovata*, Cav., a plant much more nearly allied to *Melhania*.

XI. DOMBEYA. *Cav.*; *Gærtn. fr. t.* 137.

Calyx 5-partite, persistent, reflexed, furnished with a 3-leaved lateral caducous involucel. Petals 5, persistent. Stamens 15–20; filaments only slightly united at the base; 5 sterile; 2–3 fertile between each of the sterile

Digitized by Google

ones. Style 1, 5-cleft, segments reflexed. Carpels 5, 2-valved, 1–2 seeded, closely combined into a capsule. Seeds oblong, not winged. Cotyledons crumpled, bifid.

*249. (1) D. *palmata* (Cav.:) leaves palmately 5–7-nerved, 5–7-cleft; lobes lanceolate, serrated; corymb bifid: leaves of the involucel broadly ovate, concave: fertile stamens 15: style shortly 5-cleft: seeds solitary in each carpel.—*Cav. diss.* 3. *t.* 38. *f.* 1; *DC. prod.* 1. *p.* 498; *Spr. syst.* 3. *p.* 79; *Wall. L. n.* 1159; *Wight! cat. n.* 238. *bis.*——Sent to Dr Wight by his collectors, and not marked as a cultivated plant. We consider it, however, to be a doubtful native of the Peninsula.

XII. MELHANIA. *Forsk.*

Calyx 5-partite, persistent, furnished with a 3-leaved lateral involucel. Petals 5. Stamens united into an urceolus around the ovarium; 5 sterile, alternating with 5 filaments each bearing 1–2 anthers. Style 1, 5-cleft at the apex. Capsule 5-celled, 5-valved. Seeds several in each cell, angled, not winged.

250. (1) M. *incana* (Heyne:) suffruticose: leaves between elliptical and oblong-linear, obtuse, scarcely cordate at the base, slightly serrated, under side shining with a short dense hoary pubescence: peduncles 1–2 flowered, about as long as the petiole: involucel-leaves linear, somewhat persistent: calycine segments lanceolate, acuminated: petals obovate, longer than the calyx: fertile filaments bearing 1 anther: capsule hairy: seeds 2–4 in each cell, tuberculated.—*Heyne! in Wall. L. n.* 1200; *Wight! cat. n.* 244.—— Mysore; *Heyne*, 15. *Oct.* 1801. Nabab-Sawadi near Palamcottah; *Klein, Nov.* 16. 1795.

This has so much the appearance of *Brotera ovata*, Cav. ic. 5. t. 433, that we can scarcely see any character to separate them except the distinct styles in the latter. It seems also exceedingly closely allied to *M. Burchellii*, DC.

XIII. PTEROSPERMUM. *Schreb.; Lam. ill. t.* 576.

Calyx leathery, 5-partite, somewhat tubular at the base; segments linear, tomentose outside, hairy within. Petals 5, oblique, shorter than the calyx. Stamina 20 (of which 5 are sterile), united at the base into a column with the stalk of the ovarium. Style slender, club-shaped. Capsule woody, 5-celled, 5-valved. Seeds produced into a broad membranaccous wing. Albumen in small quantity or entirely wanting. Cotyledons crumpled. Radicle cylindrical.

251. (1) P. *rubiginosum* (Heyne:) leaves very obliquely ovate, unequally 3-nerved (the midrib and two nerves on one! side) at the base, acuminated, quite entire; under side covered with a dense soft rusty-coloured tomentum: peduncles rather longer than the petioles.—*Heyne in Wall.! L. n.* 1168; *G. Don in Mill. dict.* 1. *p.* 538.

The specimen before us is very imperfect. We do not know the locality.

252. (2) P. *suberifolium* (Lam.:) leaves cuneate-oblong, shortly acuminated, coarsely toothed or somewhat lobed towards the apex, oblique and 4-nerved at the base; under side clothed with a short thick pubescence; veins scarcely prominent beneath: peduncles about 3-flowered, slightly longer than the petioles: involucel-leaves about 3, linear, entire, a little distant from the flower, very caducous: petals linear-oblong, patent: sterile filaments filiform: ovarium with four ovules in each cell: capsule obovoid, acutish, outside encrusted with a dense furfuraceous pubescence: seeds usually 2 in each cell. —*Lam. ill. t.* 576. *f.* 1; *Wall.! L. n.* 1166; *Wight! in Hook. bot. misc.* 3. *suppl. t.* 26; *cat. n.* 239.—P. canescens, *Roxb. hort. Bengh. p.* 50; *in E. I. C.*

Digitized by Google

mus. tab. 1989.—Pentapetes suberifolia, *Linn.; Cav. diss.* 3. *t.* 43. *f.* 2.—*Amm. in. act. Petrop.* 8. *t.* 14.——Southern districts of the Peninsula.

Flowers small, about an inch and a quarter across.

253. (3) P. *reticulatum* (W. & A.:) leaves cuneate-oblong, 4-nerved, oblique and slightly cordate at the base, acuminated, entire or coarsely toothed towards the apex; under side covered with white mealy pubescence, reticulated with prominent veins: peduncles about 3-flowered, crowded towards the extremity of the branches, longer than the petioles: involucel-leaves palmatifid, a little distant from the flowers, caducous: petals obovate-oblong, patent: sterile filaments filiform: ovarium with about 6 ovules in each cell. —*Wight! cat. n.* 241.

Flowers much larger than those of the last, but not nearly so much so as in the next.

254. (4) P. *Heyneanum* (Wall.:) leaves cuneate-oblong, acuminated, slightly cordate and 4–5-nerved at the base, and sometimes a little oblique, coarsely toothed or lobed towards the apex; under side clothed with a roughish tomentum; veins slightly prominent: petioles short, attached a little within the margin: peduncles axillary, very short: involucel-leaves and bracteoles imbricated round the base of the flower-bud, palmatifid and laciniated, deciduous: petals obovate, patent: sterile filaments linear: capsule oblong, acute; outside encrusted with a furfuraceous pubescence: seeds 8 in each cell.—*Wall. ! L. n.* 1169; *Wight ! cat. n.* 240.—P. suberifolium, *Willd. sp.* 3. *p.* 728; *Sim's bot. mag. tab.* 1526; *Roxb. hort. Bengh. p.* 50; *in E. I. C. mus. tab.* 97; *DC. prod.* 1. *p.* 500; *Spr. syst.* 3. *p.* 80.—Velago xylocarpa, *Gærtn. fr. t.* 133.——Gingie hills, and elsewhere in the southern provinces.

Flowers large, nearly as much so as in *P. acerifolium*; sepals about 2 inches long.

255. (5) P. *glabrescens* (W. & A.:) leaves cuneate-obovate, shortly acuminated, entire, cordate, equal and 5-nerved at the base; under side very shortly pubescent; veins conspicuous; petioles short, marginal; stipules palmate, persistent; peduncles axillary, about the length of the petiole: capsule oblong, 5-angled, suddenly acuminated, glabrous; cells 10–12 seeded.—*Wight! cat. n.* 242.—P. Heyneanum, *Wall.! L. n.* 1169. *g.*—*Rheed. Mal.* 6. *t.* 58.

We have only seen very imperfect specimens. It is most allied to *P. acerifolium*, but has much shorter petioles, and fewer nerves at the base of the leaf. The flowers in Rheede's plate are larger than in the next species.

*256. (6) P. *acerifolium* (Willd.:) leaves roundish, entire or coarsely toothed, cordate at the base, usually more or less peltate and 10–12-nerved at the insertion of the petiole; under side clothed with roughish tomentum; veins conspicuous; petioles elongated: pedicels axillary, much shorter than the petiole: involucel-leaves at a little distance from the flower, very caducous: petals linear-revolute: sterile filaments club-shaped: ovarium oblong, 5-angled, with 12–14 ovules in each cell: capsule oblong, 5-angled; outside encrusted with a furfuraceous pubescence.—*DC. prod.* 1. *p.* 500; *Spr. syst.* 3. *p.* 80; *Roxb. hort. Bengh. p.* 50; *in E. I. C. mus. tab.* 960; *Wall.! L. n.* 1170.—Pentapetes acerifolia, *Cav. diss.* 3. *t.* 44.—*Amm. act. Petr.* 8. *t.* 16–17.

We insert this as Wallich obtained it from the Madras herbarium, but we suspect it not to be a native of the Peninsula. Mr Arnott has specimens from Canton, China, and from Silhet. We have not seen the mature fruit: the ovarium is 5-angled, and both Ammana nd Cavanilles represent the fruit to be so likewise. According to these botanists, it is obtuse or at most acute, without the remarkable acumination of the last species; it appears also to be at least twice as large.

XIV. KYDIA. *Roxb.*

Calyx campanulate, 5-lobed, persistent, surrounded by, and united at the

Digitized by Google

base with a 4–6 leaved involucel. Petals 5, obliquely obeordate, longer than the calyx, attached by their claws to the base of the staminal column. Stamens monadelphous, the tube split about the middle into 5 segments, each bearing 4 anthers closely placed together at the apex: sterile filaments none. Ovarium single, 3-celled: ovules 2, collateral, erect at the base of each cell. Style 1, 3-cleft. Stigma dilated, peltate, fleshy. Capsule 3-valved, 3-celled, 1–2 cells being occasionally abortive; perfect cells 1-seeded. Seed erect.—Trees with alternate 5-nerved, somewhat 5-lobed, leaves. Flowers white, panicled.

257. (1) K. *calycina* (Roxb.:) involucel 4–6-leaved, at first shorter, at length much longer than the calyx.—*Roxb. Cor.* 3. *p.* 11. *t.* 215; *DC. prod.* 1. *p.* 500; *Spr. syst.* 3. *p.* 85; *Wall.! L. n.* 1176; *Wight! cat. n.* 236.——Coromandel. Neelgherries.

Roxburgh represents the anthers sessile in five groups at the top of the column, but this is surely a mistake, for in our specimens, both with the short and long involucel, the staminal tube is split down to the middle, into 5 segments as in our generic character. *K. pulverulenta*, Ham.! in Wall. L. n. 1176. *k.* is precisely the same with the state of our plant with short involucels.

†258. (2) K. *fraterna* (Roxb.:) involucel 6-leaved, shorter than the calyx.—*Roxb. Cor.* 3. *t.* 216; *DC. prod.* 1. *p.* 501; *Spr. syst.* 3. *p.* 85.——Circars; *Roxburgh.*

With this we are unacquainted except by Roxburgh's figure, but we cannot see how it differs from the young state of *K. calycina.* It is not in Wallich's List.

TRIBE VI.—ERIOCHLÆNEÆ. *Arn.*

Calyx 4–5-partite or lobed, with a 3–5-leaved involucel. Petals 4–5, flat. Stamens numerous in a multiple series, the outer ones shorter, all united into one conical column as in Malvaceæ: sterile filaments none, anthers 2-celled, erect.

XV. ERIOCHLÆNA. *DC.*

Involucel at first close to the flower, 3–5-leaved; leaves pectinate, or much cut and jagged, shorter than the calyx. Calyx 5-partite: segments linear-acuminated, with two glands on the inside at the base. Petals 5, shorter than the calyx: claws coriaceous, tomentose. Stamens numerous, all fertile, in many rows, monadelphous; outer ones gradually shorter. Ovarium ovate, 10-celled: ovules numerous, in a double row in each cell. Style 1: stigma 10-lobed, stellate. Capsule woody, 10-celled, 10-valved. Seeds numerous in each cell, terminated by a tapering wing.—Trees. Leaves petioled, cordate-ovate, serrated; under side pubescent or tomentose. Peduncles axillary, bearing three or more flowers towards the extremity.

259. (1) E. *Hookeriana* (W. & A.:) leaves roundish-cordate, very shortly acuminated, toothed, on longish petioles; upper side nearly quite glabrous, under starry-pubescent: peduncles 3-flowered, scarcely longer than the petioles, covered with scattered stellate pubescence, at length nearly glabrous: involucel-leaves more than a half shorter than the calyx, pubescent, much cut and jagged; style densely pubescent: capsule ovate.—*Wight! cat. n.* 956.——Columala.

XVI. MICROCHLÆNA. *Wall.*

Involucel at length at a distance from the flower; leaves small lanceolate and entire, or minute ovate lobed and caducous. Calyx 4–5-partite; seg-

Digitized by Google

ments oblong-linear, with two glands on the inside at the base. Petals 4–5, about the length of the calyx: claws coriaceous, tomentose. Stamens about 20, all fertile, united into a conical tube; outer ones shorter. Ovarium ovate, 5, 8, or 10-celled: ovules numerous, in a double row, in each cell. Style 1: stigma 5–10-lobed, stellate. Capsule woody, 5–10-celled, 5–10-valved. Seeds winged.—Trees. Leaves on long petioles, broadly ovate, cordate, pubescent or tomentose beneath, serrated. Peduncles axillary, panicled, longer than the leaves.

This is the same genus with *Wallichia*, DC. (not Roxburgh), but we entertain very great doubts as to its being distinct from *Eriochlæna*: indeed our *M. quinqueloculoris* has the involucel, although very minute, more allied in shape to that of *Eriochlæna*. De Candolle states that the cells of the capsule in *Microchlæna* (his *Wallichia*) are 1-seeded; we have not seen the fruit, but can scarcely think that so many ovules become abortive. He also attributes to it the quaternary arrangement of parts of the flower: in our specimen of the same species he describes, we find, the quinary: whence it is probable that the quaternary was an accidental suppression of a fifth part of the normal number.

260. (1) M. *quinqueloculoris* (W. & A.:) involucel leaves minute, caducous, 3–5-lobed: ovarium 5-celled: stigma 5-lobed.—*Wight! cat. n.* 253.

ORDER XXIV.—HUGONIACEÆ. *Arn.*

Calyx without an involucel, persistent, 5-sepaled: sepals distinct, acute, unequal; the two exterior lanceolate, densely pubescent on the back; another dimidiate-ovate, the straight side pubescent, the rounded side testaceous and shining; the two inner ones roundish ovate and suddenly pointed, testaceous and shining except the short pubescent point: æstivation imbricated, quincuncial. Petals hypogynous, 5, alternate with the sepals, shortly unguiculate: æstivation twisted. Stamens hypogynous, 10, all fertile: filaments united at the base into an urceolus, free and filiform above: anthers cordate-ovate, erect, 2-celled, opening by two longitudinal clefts. Torus slightly elevated, supporting the staminal urceolus and the ovary. Ovarium roundish, coriaceous, glabrous, 5-celled: ovules 2 in each cell, pendulous, collateral. Styles 5, distinct: stigmas slightly dilated and lobed. Fruit (a *nuculanium*) with a fleshy epicarp, enclosing 5 distinct, bony, 1-seeded carpels. Seeds pendulous. Embryo in the axis of fleshy albumen: cotyledons flat, foliaceous: radicle short, superior, pointing to the hilum.—Shrubs. Leaves alternate, or sometimes crowded and opposite near the flowers. Stipules 2, subulate. Peduncles axillary 1-flowered, often by abortion transformed into circinnate spines.

The only genus referable here has been placed by De Candolle with doubt in Chlænaceæ, to which we cannot agree; that order having the calyx and gynœcium in a ternary, while the corolla and andrœcium follow the quinary arrangement. Kunth hesitatingly places it in Buttneriaceæ and the tribe Dombeyaceæ, and there is no doubt that the affinity is very great; it is now separated on account of the imbricate (not valvate) calyx, the ovules pendulous (not erect or ascending), and the radicle superior (not inferior), rather than invalidate the character of the order by its insertion. In many points it agrees with the character (but not the habit) of Oxalideæ, forming another link between the group of Malvaceous orders, and the Geraniaceæ. ARN.

Digitized by Google

I. HUGONIA. *Linn.; Lam. ill. t.* 572; *Gærtn. fr. t.* 58.

Character as in the order.

261. (1) H. *mystax* (Linn.:) leaves oval, glabrous, quite entire; spines opposite.—*DC. prod.* 1. *p.* 522; *Spr. syst.* 3. *p.* 69; *Wall.! L. n.* 1201; *Wight! cat. n.* 294, 295.—*Rheed. Mal.* 2. *t.* 29.——Malabar and Coromandel.

262. (2) H. *ferruginea* (W. & A.:) leaves oblong-lanceolate, acuminated, quite entire, upper side at length glabrous, under densely covered with a shining yellowish rusty-coloured tomentum; spines opposite.—*Wight! cat. n.* 296.

ORDER XXV.—TILIACEÆ. *Juss.*

Sepals 4–5: æstivation (valvular rarely imbricative?). Petals hypogynous, 4–5, rarely wanting. Stamens hypogynous, distinct, usually indefinite: anthers bilocular, dehiscing longitudinally. Torus with 4–5 glands at the base of the petals. Ovary solitary, of 4–10 carpels: style 1: stigma with as many lobes as carpels. Fruit dry, multilocular, with several seeds in each cell; or by abortion unilocular and 1-seeded. Embryo straight or curved at the radicle, in the axis of the fleshy albumen: cotyledons flat, foliaceous: radicle next the hilum.—Leaves alternate, with stipules. Petals usually entire, sometimes emarginate or slightly bifid.

I. CORCHORUS. *Linn.; Lam. ill. t.* 478; *Gærtn. fr. t.* 64 *and* 179.

Calyx deeply 4–5-partite, deciduous; segments unequal. Petals 4–5, inserted under the ovary, shorter than the calyx, equal. Stamens indefinite, rarely definite. Ovarium sessile or rarely shortly stalked, 2–5-celled. Ovules numerous, in a double row, pendulous. Style 1, erect, very short, deciduous: stigmas 2–5. Capsule elongated (pod-like) or roundish, 2–5-celled, 2–5-valved, loculicide. Seeds usually numerous in each cell.—Shrubs or herbaceous plants. Leaves alternate, serrated, entire; lower serratures usually terminated by a long bristle. Peduncles very short, axillary or opposite to the leaves, or few-flowered. Flowers yellow.

263. (1) C. *fascicularis* (Lam.:) annual: leaves oblong or lanceolate, serrated: peduncles 3–5-flowered, opposite to the leaves: capsules linear-oblong, 4–6 times longer than broad, nearly terete, villous, rostrate with 3 terminal points, 3-celled, 3-valved: seeds numerous: transverse septa nearly obsolete: stamens about 5.—*DC. prod.* 1. *p.* 505; *Spr. syst.* 2. *p.* 584; *Roxb. fl. Ind.* 2. *p.* 582; *in E. I. C. mus. tab.* 1902; *Wall.! L. n.* 6312; *Wight! cat. n.* 269.—*Pluk. t.* 439. *f.* 6.

264. (2) C. *trilocularis* (Linn.:) annual: leaves oblong or oblong-lanceolate, more or less obtuse: peduncles 1–2-flowered, opposite to the leaves: capsules slender, equal, 3–4-angled, scabrous with little prickly points, 20–30 times longer than broad, rostrate and entire at the point, 3–4-celled, 3–4-valved: seeds numerous, with nearly perfect transverse septa.—α; leaves ovate-oblong; capsules in pairs, 3-angled.—C. trilocularis, *DC.! prod.* 1. *p.* 504; *Spr. syst.* 2. *p.* 584; *Jacq. hort. Vind. t.* 173.—β; leaves ovate-oblong; capsules solitary, 4-angled.—*Wight! cat. n.* 957.—γ; leaves oblong-lanceolate; capsules in pairs, 3-angled.—C. trilocularis, *Roxb. fl. Ind.* 2. *p.* 582.—C. linearis, *Wall.! L. n.* 1070. *b.*——β. Southern provinces.

Digitized by Google

265. (3) C. *urticæfolius* (W. & A.:) annual: leaves ovate-acuminated, slightly cordate at the base: peduncles 2–3-flowered, opposite to the leaves: capsules declinate, equal, 3-angled, scabrous, about 12 times longer than broad, rostrate and entire at the point, 3-celled, 3-valved: seeds numerous, with nearly perfect transverse septa.—*Wight! cat. n.* 276.—C. olitorius, *Wall.! L.* 1072. *f.* (partly).

Most allied to *C. trilocularis*, but apparently quite distinct by the capsule being twice as short, in proportion to the breadth.

266. (4) C. *olitorius* (Linn.:) annual: leaves ovate-acuminated: peduncles 1–2-flowered: capsules nearly cylindrical, 10-ribbed, 6–8 times longer than broad, glabrous, rostrate with sometimes 5 terminal points, 5-celled, 5-valved: seeds numerous, with nearly perfect transverse septa.—*Gært. fr. t.* 64; *DC. prod.* 1. *p.* 504; *Spr. syst.* 2. *p.* 583; *Lam. ill. t.* 478. *f.* 1; *Roxb. fl. Ind.* 2. *p.* 581; *Wall.! L. n.* 1072; *Wight! cat. n.* 277.—C. decemangularis, *Roxb. fl. Ind.* 2. *p.* 582.—*Pluk. t.* 127. *f.* 3.

The Linnean plant has usually 1-flowered peduncles; in *C. decemangularis*, Roxb., they are generally 2-flowered, but we do not consider the character permanent. We have referred here the synonym of Plukenet, although he says "capsula sextuplici," probably meaning six cells; it cannot be *C. æstuans*, Linn., under which it is usually quoted.

267. (5) C. *tridens* (Linn.:) annual: leaves cuneate-oblong, linear, or lanceolate: peduncles 1–4-flowered: capsules slender, 20–30 times longer than broad, glabrous or slightly scabrous, 2–3-valved, 2–3-celled, rostrate; the beak 2–3-cleft, segments patent: seeds numerous in each cell, erect, without transverse septa.—*α*; leaves lanceolate acuminated.—*Wight! cat. n.* 271, 273.—C. tridens, *DC. prod.* 1. *p.* 505; *Spr. syst.* 2. *p.* 583; *Wall. L. n.* 1073.—*Pluk. t.* 127. *f.* 4.—*β*; leaves linear-oblong or linear-lanceolate.—*Wight! cat. n.* 274, 275.—C. Burmanni, *DC. prod.* 1. *p.* 505.—C. linearis, *Wall.! L. n.* 1070. *c.*—C. trilocularis, *Burm. Ind. t.* 37. *f.* 2.—*γ*; leaves oblong or obovate, cuneate at the base.—*Wight! cat. n.* 270, 280.

Very variable, and not uncommon in the Peninsula, but not noticed by Roxburgh in his Flora Indica.

268. (6) C. *acutangulus* (Lam.:) annual: leaves ovate: peduncles opposite to the leaves, 1–2-flowered: capsules prismatical, straight, glabrous, stout, about 10 times longer than broad, 6-angled with 2–3 of the angles winged, 3-celled, truncate with 3–5 divaricating entire or bifid horns: seeds numerous in each cell, with the transverse septa nearly obsolete.—*DC. prod.* 1. *p.* 505; *Spr. syst.* 2. *p.* 583; *Wall.! L. n.* 1069; *Wight! cat. n.* 272, 279.—C. subscandens, *Wall.! L. n.* 1074 (corrected at p. 237 to *C. æstuans*).—C. fuscus, *Roxb. fl. Ind.* 2. *p.* 582.—C. æstuans, *Gærtn. fr. t.* 64.—*Pluk. t.* 44. *f.* 1.

We can see no difference between specimens in Mr Arnott's herbarium from St Domingo (gathered by Bertero, and described by De Candolle), or from Demerary (gathered by C. S. Parker, Esq.), and those from East India.

269. (7) C. *capsularis* (Linn.:) annual: leaves oblong acuminated: capsules globose, truncated, wrinkled and muricated, 5-celled; seeds few in each cell, without transverse septa.—*DC. prod.* 1. *p.* 505; *Spr. syst.* 2. *p.* 584; *Gærtn. fr. t.* 179; *Roxb. fl. Ind.* 2. *p.* 581; *Wall.! L. n.* 1071; *Wight! cat. n.* 278.—*Pluk. t.* 275. *f.* 4; *Rumph. Amb.* 5. *t.* 78. *f.* 1.

In addition to the 5 fertile cells there are other 5, alternating, smaller, and empty.

II. TRIUMFETTA. *Linn.; Lam. ill. t.* 400; *Gærtn. fr. t.* 111.

Calyx 5-partite, coloured, deciduous: segments linear, sometimes obtuse, usually mucronate a little below the apex. Petals 5, not glandular on the inside, inserted at the base of the stalk-like torus, equal, shorter than the

Digitized by Google

calyx, sometimes abortive. Stamens 5–35, springing from the top of the torus. Torus dilated at the apex, 5-toothed, supporting the stamens and ovary. Glands 5, attached round the torus, and opposite to the petals. Ovarium 2–4-celled, with 2 collateral pendulous ovules in each cell separated by a false dissepiment. Style 1, 2–5-toothed at the apex. Fruit globose, echinated with hooked prickles, 2–4-celled; either separable into 2–4, sometimes imperfectly bilocular, usually 2-seeded cocci; or indehiscent, and the cells 1-seeded. Radicle superior.—Shrubs or herbaceous plants, with stellate pubescence. Leaves alternate, entire or lobed, serrated; lower serratures usually glandular. Peduncles axillary, solitary, or usually several together, bearing about 3 bracteas and 3 flowers at the apex: pedicels when in fruit reflexed. Flowers yellow.

In this genus it may be right to caution the student, as also the mere herbarium-, or cultivator-botanist, to place almost no reliance on the shape of the leaves or their pubescence, or suppression of the parts of the flower. Linnæus characterised two species only: modern botanists have swelled this number almost to 50; most of these, we refer particularly to those of Blume, St Hilaire, Kunth, and De Candolle, are descriptions of so many *individuals*, not *species*.

270. (1) T. *pilosa* (Roth:) stems herbaceous, roughly hairy, or tomentose: upper leaves ovate, acuminated, entire; lower ones somewhat 3-lobed; all unequally serrated, hairy; under side tomentose: peduncles several together, axillary and opposite to the leaves, 3-flowered: calyx apiculate: stamens 10; filaments glabrous: fruit hairy, 4-celled, 8-seeded; prickles glabrous at the apex, ciliated below with spreading hairs.—*Roth. nov. sp. p.* 223; *DC. prod.* 1. *p.* 506; *Spr. syst.* 2. *p.* 452; *Wight! cat. n.* 286, 287.—T. Lappula? *Heyne!*—T. vestita, *Wall.! L. n.* 1078.—T. Indica, *Lam.?; DC.? prod.* 1. *p.* 506.

Roth seems to have overlooked entirely the deciduous calyx. We have examined Heyne's plant, and consequently that intended by Roth; we have also before us Wallich's n. 1078, *a*, *c*, *d*, yet the only differences we can assign are in the prickles of the fruit being hairy to above or only below the middle, and the more or less lobed leaves. In Dr Wight's and Heyne's specimens, from their being taken from the upper part of the branches, the leaves are entire. Wallich's n. 1078. *d*, in Hamilton's herbarium, is the same as that from Dr Wight, but is accompanied by a 3-lobed leaf from the lowest part of the stem. Dr Wallich's n. 1078. *a*, in Mr Arnott's herbarium, has both entire and 3-lobed leaves upon the branches, so that we conceive that we are right in uniting them all. The fruit is about the size of a cherry.

†*271. (2) T. *oblongata* (Link:) annual: stem branched, villous towards the summit: leaves oblong, serrated, 5-nerved, softly hairy: flowers terminal, crowded.—*DC. prod.* 1. *p.* 507; *Wall. L. n.* 1077.—T. glandulosa, *Herb. Heyne.*

This we do not know: we suspect, however, that Heyne's and the Peninsular plant is the same with one of those we have referred to *T. pilosa*. As far as we can ascertain by his list, Wallich appears to consider his own *T. oblonga* (Don's prod. fl. Nep. p. 227), to be the same with *T. oblongata*; while De Candolle refers it without doubt to *T. trichoclada*, Link., and G. Don in Miller's dict. still keeps it distinct. No characters have yet been given to distinguish any of them.

272. (3) T. *angulata* (Lam.:) stems herbaceous, glabrous or pubescent: uppermost leaves ovate, acuminated; middle and lower ones cuspidately 3–5-lobed; all more or less covered with stellate hairs, serrated: peduncles 2–3 together, axillary and opposite to the leaves, 3-flowered: calyx apiculate: stamens 10; filaments glabrous: fruit pubescent, 4–5-celled, 4–8-seeded; prickles glabrous.—*DC. prod.* 1. *p.* 507; *Spr. syst.* 2. *p.* 450; *Wall.!*

Digitized by Google

L. n. 1075. *a–d*; *Wight! cat. n.* 282; *Lam. ill. t.* 400. *f.* 2.—T. Bartramia, *Linn.* (partly); *Roxb. fl. Ind.* 2. *p.* 463; *in E. I. C. mus. tab.* 1434.—*Pluk. t.* 41. *f.* 5.

Fruit small, about the size of a vetch-seed. If Wallich's No. 1075. *f.* belong also to this species, then the flowers are sometimes pentandrous. We do not know his No. 1075. *g.* from the Madras herbarium.

273. (4) T. *glabra* (Herb. Miss.!:) stems herbaceous, pubescent: leaves serrated, roundish, scarcely cordate, cuspidately 3-lobed, nearly quite glabrous: peduncles by the abortion of the upper leaves arranged in a longish terminal interrupted raceme: calyx apiculate: stamens numerous (30–35); filaments glabrous: fruit slightly hairy; prickles slightly ciliated to above the middle.—*Spr. syst.* 2. *p.* 450; *Wight! cat. n.* 283.——Balticalo; *Rottler.*

Fruit nearly the size of a small cherry.

274. (5) T. *rotundifolia* (Lam.:) stems herbaceous, pubescent: leaves roundish, unequally and deeply toothed; upper side nearly glabrous, under tomentose: peduncles by the abortion of the upper leaves arranged in a long interrupted raceme: calyx apiculate: stamens numerous (15–25); filaments glabrous: fruit densely pubescent; prickles slightly pubescent or nearly glabrous.—*Lam. enc. meth.* 3. *p.* 421; *DC. prod.* 1. *p.* 506; *Spr. syst.* 2. *p.* 451; *Roth. nov. sp.* 222; *Wight! cat. n.* 285.—T. suborbiculata, *DC. prod.* 1. *p.* 506; *Spr. syst.* 2. *p.* 451.—T. orbiculata, *Wall.! L. n.* 1076.

275. (6) T. *neglecta* (W. & A.:) annual, erect, branched: stem roughish: leaves roundish, 3–5-nerved at the base, 3–5-lobed, irregularly toothed, pubescent on both sides; upper leaves attenuated at both ends, upper side hairy, under tomentose: peduncles lateral and opposite to the leaves, bearing several flowers, sometimes by the abortion of the leaves arranged in an interrupted raceme: calyx apiculate: stamens 5–8, filaments hairy on the back: fruit hairy, 2–4-celled, cells 1-seeded; prickles ciliated.—*Wight! cat. n.* 284.

The above character is taken from a description made by Dr Wight on the spot, who likewise observed that, in some flowers, the calyx resembled an involucrum, and the corolla a calyx covered with stellate tomentum.

† 276. (7) T.? *microphylla* (W. & A.:) stems herbaceous, erect, branched, glabrous: leaves oblong-lanceolate, entire, sharply serrated, glabrous: peduncles bearing 1–3-flowers, opposite? to the leaves: stamens 5–8.—*Wight! cat. n.* 281.

The specimens before us are in a state of monstrosity: the calycine segments are united into a tubular, or sometimes urceolate, 5-apiculate floral covering or involucrum, similar to what Dr Wight observed in the last species: the stamens are in some flowers converted into 5 large glands; in others there are from 5 to 8, assuming their proper appearance, but destitute of pollen: in some flowers petals are present, in others absent: in some the ovarium is converted into an infundibuliform corolla, with a long tube, and a limb of 5 lanceolate acuminate segments; while in others it resembles an oblong, 5-angled ovary. We think, however, that it is a species of *Triumfetta*: it was sent formerly to Dr Wallich as a doubtful *Mahernia*, but we do not observe it noticed in his list.

III. GREWIA. *Linn.*; *Gærtn. fr. t.* 106; *Lam. ill. t.* 467.

Calyx 5-sepaled, deciduous: sepals coriaceous, coloured on the inner side. Petals 5, with a nectarial gland or hollow at the base on the inside, inserted at the base of the stalk-like torus, sometimes minute or wanting. Stamens numerous, springing from the summit of the torus: anthers roundish. Style 1: stigma 2–4-lobed. Ovarium of 3–4, 2-ovuled carpels. Ovules erect. Drupe (nuculanium) with 1–4 pyrenæ: nuts 2-celled, rarely 3–4-celled, sometimes

Digitized by Google

by abortion 1-celled; cells 1-seeded. Albumen fleshy. Radicle inferior.—Spreading shrubs or trees with stellate pubescence. Leaves usually serrated, and often resembling those of the elm. Inflorescence axillary or terminal; pedicels umbellate; bracteoles at the base of the pedicels, included in an involucrum in the terminal inflorescence, naked in the axillary.

Allied to *Triumfetta*, but there the glands, between the petals and stamens, are attached to the torus; here, to the petals. There are also other characters given in the descriptions. That part of the torus which is opposite to the glands of the petals is glabrous, while above them it is tomentose.

§ 1. *Inflorescence axillary, or occasionally terminal by the abortion of the leaves: peduncles solitary or several together, bearing one or more umbellate flowers: petals with a gland: ovary of 4 united carpels.* Grewia, *Linn.*

\+ Leaves 3-nerved.

277. (1) G. *orientalis* (Linn.:) shrubby: leaves 3-nerved, ovate- or oblong-lanceolate, shortly and bluntly acuminated, sometimes slightly cordate at the base, crenulated, nearly quite glabrous, or roughish beneath on the nerves and veins with close-pressed hairs: peduncles axillary, solitary, about 3-flowered, 2–3 times the length of the petiole: bracteoles many times shorter than the pedicels: sepals linear, narrow, covered with a tawny-coloured tomentum, twice the length of the lanceolate acute, straight, entire petals: torus elongated beyond the glands: style scarcely so long as the stamens: drupes nearly globose, flattish on the top, slightly 4-lobed, covered with a short tomentum mixed with rather longer simple hairs: nuts 4, 2–3-celled.—*DC. prod.* 1. *p.* 510; *Spr. syst.* 2. *p.* 580; *Roxb.? fl. Ind.* 2. *p.* 586; *Roth. nov. sp. p.* 242?; *Wall.! L. n.* 1100. *d* (and perhaps the others); *Wight! cat. n.* 258.—G. obtusa, *Wall.! L. n.* 1103. *c.*?—G. rhamnifolia, *Herb. Madr.?; Roth. nov. sp. p.* 244.—G. carpinifolia *β*, *DC.? prod.* 1. *p.* 511.

Although none of the specimens before us present the cordate base of the leaf, yet we entertain little doubt of *G. rhamnifolia* being the same. The fruit is never, that we have seen, covered with "erect, strong hairs," whence we suspect that part of Roth's description of *G. orientalis* to belong to *G. columnaris;* Roxburgh perhaps had also both plants in view, as well as our *G. emarginata.*

278. (2) G. *bracteata* (Roth.:) shrubby: leaves 3-nerved, ovate, shortly and obtusely acuminated, bluntly serrulated, glabrous, or scabrous beneath on the nerves and veins: peduncles axillary, solitary or sometimes in pairs, as short as the petiole, about 3-flowered: bracteoles longer than the pedicels: sepals linear, narrow, covered with a shining golden-coloured tomentum, 5–8 times longer than the oblong recurved entire petals: torus elongated beyond the glands; style clavate at the apex, longer than the stamens: drupes somewhat 2-lobed, narrowed towards the base, covered with a short tomentum; nuts solitary in each lobe and 2–3-celled, or in pairs and 1–2-celled.—*Roth. nov. sp. p.* 243; *DC. prod.* 1. *p.* 508; *Spr. syst.* 2. *p.* 580; *Wight! cat. n.* 250, 251. —G. obtusa, *Wall.! L.* 1103. *a*, *e* (and probably *b*, *d.*)

No. 250 was sent to Dr Wallich without a name, and corresponds therefore to his No. 1103 *b* or *d*, we rather think the latter, as that letter is marked with doubt, and it has a slightly different appearance from his *a*. As to Wallich's *G. bracteata*, n. 6309, sent by Dr Wight, we do not think it belongs to the present species, but we have at present no means of ascertaining what it really is. The stamens are of a deep orange-colour.

279. (3) G. *columnaris* (Sm.!:) shrubby: leaves 3-nerved, ovate, oblong or lanceolate, rounded or slightly cordate at the base, shortly acuminated, acute or obtuse, rigid, glandularly crenated, scabrous on both sides but particularly the upper with very short scattered stellate hairs: peduncles axil-

Digitized by Google

lary, solitary, about twice as long as the petioles, 3–5-flowered, frequently forming a terminal corymb: bracteoles half as long as the pedicels: sepals linear, narrow, covered with a somewhat golden-coloured tomentum, about 3 times longer than the lanceolate obtuse or scarcely acute straightish entire petals: torus elongated beyond the glands: style clavate at the apex, longer than the stamens: drupes turbinate, slightly 4-lobed, bristly-hairy, not tomentose; hairs from a tuberculate base; nuts 4, each 1–2-celled.—*DC. prod.* 1. *p.* 510; *Spr. syst.* 2. *p.* 580; *Wight! cat. n.* 257, 259.—G. pilosa, *Lam.? encycl. meth.* 3. *p.* 43 (as to the fruit.)—G. pilosa, *Wall.! L. n.* 1112. *c, d* (probably also *e* and *f.*)—G. orientalis, *Vahl, symb.* 1. *p.* 34.—*Pluk. t.* 50. *f.* 4; *Rheed. Mal.* 5. *t.* 46.?

We have before us three specimens, unnamed, corresponding with those sent to Dr Wallich; these probably form his No. 1112. *e* and *f.* Of Wallich's 1112. *a.* we know nothing; his *b.* is *G. sepiaria*, Roxb. (*G. serrulata*, DC.) The torus is scarcely more elongated than in the two preceding species. The leaves vary from cordate-ovate to lanceolate-acuminated. Flowers white.

†*280 (4) G. *obliqua* (Juss.:) shrubby: leaves 3-nerved, lanceolate, oblique, toothed, roughish on both sides with scattered stellate hairs: stipules linear, the length of the short petioles: peduncles solitary, axillary, longer than the petiole, 3-flowered: stamens shorter than the sepals but longer than the petals.—*Juss. in Ann. mus.* 4. *p.* 91; *DC. prod.* 1. *p.* 511; *Spr. syst.* 2. *p.* 581.

Leaves about an inch and a half long. Of this species little is known; it probably is only one of the forms of *G. columnaris*; or perhaps it is referable to *G. pilosa.*

281. (5) G. *lævigata* (Vahl:) arborescent: leaves 3-nerved, oval, with a long attenuation, nearly entire at the base, serrated upwards, almost quite glabrous on both sides, or scabrous beneath on the nerves and veins: peduncles axillary, solitary or 2–3 together, slender, 2–3 times longer than the petioles, 2–3-flowered: bracteoles many times shorter than the pedicels: sepals linear, narrow, 3–4 times longer than the oblong entire bluntish petals: torus scarcely longer than the glands: style filiform, longer than the stamens; stigma fringed: drupe deeply 2-lobed, glabrous; nuts 1–2 in each lobe, 1–2-celled.—*Vahl, symb.* 1. *p.* 34; *DC. prod.* 1. *p.* 510; *Spr. syst.* 2. *p.* 578.—G. ovalifolia, *Juss.? in ann. mus.* 4. *p.* 90; *DC.? prod.* 1. *p.* 510.—G. didyma, *Roxb. fl. Ind.* 2. *p.* 591; *in E. I. C. mus. t.* 229; *Wall.! L. n.* 1086; *G. Don in Mill. dict.* 1. *p.* 549.—G. disperma, *Rottl. in Spr. syst.* 2. *p.* 579; *G. Don l. c. p.* 551.

Our only hesitation regarding the synonym of Jussieu arises from his stating the petals to be half as long as the calyx; but as there appears to be but one species known in the Peninsula with attenuated glabrous leaves, and glabrous fruit, we suspect some error in his description.

282. (6) G. *salvifolia* (Heyne:) shrubby: leaves 3-nerved, oblong, obtuse or acute, oblique at the base, sharply serrulated; upper side nearly glabrous, under hoary with a white very short close tomentum: peduncles axillary, solitary, 1–3-flowered; pedicels somewhat divaricated, rather longer than the peduncle: sepals linear-lanceolate, twice the length of the oblong-lanceolate entire petals: style filiform, a little longer than the stamens: drupe of 2 globose lobes (or sometimes 1 by abortion), glabrous; nuts solitary in each lobe, 4-celled.—*Heyne in Roth. nov. sp. p.* 239; *DC. prod.* 1. *p.* 509; *Spr. syst.* 2. *p.* 580; *Wight! cat. n.* 249.—G. excelsa, *Wall.! L. n.* 6307. *b.*—G. Damine, *Gært. fr. t.* 106. *f.* 7 (good).

There is a specimen in the Banksian herbarium from Russell, marked *G. glabra*, Roxb.: as no such name, however, occurs in Roxburgh's works, we suspect it to have been intended for *G. lævigata*, under which Heyne sent specimens of the following to Roth. But the following is *G. salvifolia*, Roxb., so that it is highly probable that Roxburgh had both plants in view; perhaps, indeed, they are not distinct species.

Digitized by Google

283. (7) G. *Rothii* (DC.:) shrubby: leaves 3-nerved, ovate-oblong, acuminated, obtuse or acute, sharply serrulated; upper side glabrous, under hoary with short white tomentum: peduncles 2–3, axillary, slender, 6–8 times longer than the petioles; pedicels much shorter than the peduncles, twice as long as the bracteoles: sepals linear, narrow, twice the length of the oblong entire petals: style filiform, a little longer than the stamens; stigma dilated: drupe globose, glabrous, with 2 1–2-celled nuts.—*DC. prod.* 1. *p.* 509; *Spr. syst.* 2. *p.* 579.—G. bicolor, *Roth, nov. sp. p.* 240 (not *Juss.*)—G. lævigata, *Heyne* (not *Vahl.*)—G. salvifolia, *Roxb. fl. Ind.* 2. *p.* 587; *in E. I. C. mus. tab.* 225; *Wall.*? *L. n.* 1090. *a.*—G. excelsa, *Wall.*? *L. n.* 6307. *a.*

Our character is principally taken from Roxburgh's figure.

284. (8) G. *hirsuta* (Vahl:) shrubby: leaves 3-nerved, lanceolate, acuminated, obliquely rounded or cordate at the base, acutely and unequally serrated; upper surface slightly wrinkled, hairy or slightly tomentose, of the adult leaves nearly glabrous; under densely tomentose: peduncles 1–3, axillary, about the length of the petioles, 2–4-flowered: pedicels rather shorter than the peduncles: sepals lanceolate, more than twice the length of the petals: petals oblong, entire, lower half villous on the back and ciliated on the margin: torus scarcely longer than the glands: style filiform, longer than the stamens; stigma large, 2–3-lobed, stellately penicillate: drupes nearly globose, hairy, slightly 4-lobed; nuts 4, each 2-celled.—*Vahl! symb.* 1. *p.* 34; *DC.* prod.* 1. *p.* 509; *Spr. syst.* 2. *p.* 580; *Roxb. fl. Ind.* 2. *p.* 587; *Wight! cat. n.* 256.—G. tomentosa, *Roxb. in E. I. C. mus. tab.* 226.—G. pilosa, *Roxb. fl. Ind.* 2. *p.* 588; *in E. I. C. mus. tab.* 1447 (not *Lam.*)—G. montana, *Koen.! in herb. Banks.*—G. salvifolia, *Wall.!* (not *Roxb.*) *L. n.* 1091. *a–d.*—G. helicterifolia, *Wall.! L. n.* 1090. *c.*—G. Roxburghii, *G. Don in Mill. dict.* 1. *p.* 548 (exclus. syn.)——Jungles near Madras, Wandawasi, Nandaradah, &c.

Roxburgh in his earlier description of this plant as *G. hirsuta*, and corresponding drawing as *G. tomentosa*, has described the fruit as having 1-celled nuts, probably from having only cut it transversely: we find them almost constantly 2-celled: the distinguishing characters, therefore, given at p. 588 of the fl. Ind. are insufficient, and we therefore unite the Bengal to the Coromandel species; the only difference being that the leaves of *G. pilosa* are linear-lanceolate, in *G. hirsuta* approaching to ovate-lanceolate; which differences may arise from cultivation, in which state only Roxburgh knew his *G. pilosa*. Wallich's n. 1090. *b!*, *d!*, *e!*, and n. 1091. *e!*, belong to *G. polygama*, Roxb.! (fl. Ind. 2. p. 589, and in E. I. C. mus. tab. 1448), a species differing from *G. hirsuta* by having male flowers without the least trace of a pistillum on one plant, and bisexual flowers on another; in it also the petals are not hairy on the back, and the gland, not the petal, is tomentose round the margin: besides, the nuts of the fruit are 1-celled. We do not know Wall. L. n. 1090. *a.*

285. (9) G. *pilosa* (Lam.:) shrubby: leaves 3-nerved, on very short petioles, cuneate- or obovate-oblong: lanceolate scarcely acuminated, rounded or slightly cordate at the base, unequally serrated, rough with stellate hairs; under side with the hairs longer more copious and softer: peduncles 1–3, axillary, the length of the petiole, 3-flowered; pedicels as long as the peduncles and the bracteoles; sepals linear, narrow: petals linear, bifid!, as long as the stamens and about two-thirds of the length of the calyx: torus scarcely exceeding the glands: style filiform, a little longer than the stamens; stigma 4-partite, segments filiform: drupes 1–4-lobed, crustaceous, covered with stellate hairs; nuts 1–4, 1–3-celled.—*Lam. enc. meth.* 3. *p.* 43 (excl. syn., and char. of fruit?); *DC. prod.* 1. *p.* 510; *Spr. syst.* 2. *p.* 580; *Wight! cat. n.* 262.—G. carpinifolia, *Roxb.* (not *Juss.*) *fl. Ind.* 2. *p.* 587; *in E. I. C. mus. tab.*

* We are at a loss to know why De Candolle and Mr G. Don have given the locality of "Java" to this plant. Vahl received it from Koenig, gathered in the Peninsula. Koenig's mst. name was *G. montana*; Wallich calls it *G. salvifolia*; and, by a singular coincidence, Roxburgh in his Fl. Ind. 2. p. 503, refers both these names to *Alangium hexapetalum*, Linn.

Digitized by Google

224; *Roth. nov. sp. p.* 245 (partly); *Wall.! L. n.* 1093. *c.* (partly).—G. scabrida, *Wall.! L. n.* 1113. *b–d.*—G. commutata, *DC. prod.* 1. *p.* 511; *Spr. syst.* 2. *p.* 581.—G. flavescens, *Juss. in Ann. mus.* 4. *p.* 91; *DC. prod.* 1. *p.* 510; *Spr. syst.* 2. *p.* 580.—G. orientalis, *Gært.? fr. t.* 106.

Flowers small.

286. (10) G. *emarginata* (W. & A.:) shrubby: leaves 3-nerved, roundish-obovate, scarcely acute, more or less cordate at the base, unequally toothed, teeth glandular; upper side slightly scabrous with minute stellate pubescence, under pale with a short close starry tomentum: peduncles axillary, 4–5 times longer than the petioles, solitary, 3–6-flowered: bracteoles at the base of the pedicels unequal, somewhat persistent: sepals lanceolate, twice as long as the oblong emarginate petals: torus elongated: style clavate at the apex, longer than the stamens; stigma 4-lobed: drupes at first hairy, afterwards glabrous and shining, 4- (or sometimes 1–2-) lobed; nuts usually 4 and 1-celled, or fewer and 1–2-celled.—*Wight! cat. n.* 260, 261.—G. carpinifolia, *Roth. nov. sp. p.* 245 (partly); *Wall.! L. n.* 1093 (partly).—G. orientalis, *Roxb.? in E. I. C. mus. t.* 222.

It is difficult to say whether Roxburgh's figure of *G. orientalis* belongs to this or to *G. columnaris*, as the colour of the flower is not noted on the copy of the drawing before us. Roxburgh and the missionaries appear to have considered this, *G. orientalis*, *G. bracteata*, *G. columnaris*, and *G. pilosa*, as varieties. Dr Wight sent none but this to Wallich as *G. involucrata* (see Wall. L. n. 1093); but the latter referring it to *G. carpinifolia*, and receiving at the same time specimens from Dr Wight of a "*G. carpinifolia*," obtained from the Madras herbarium, his assistants appear to have mixed the two under his No. 1093. *c*, as the specimen of that in Mr Arnott's herbarium belongs to *G. pilosa* (Wall. L. n. 1113. *c.*)

287. (11) G. *abutilifolia* (Juss.:) arborescent: leaves 3-nerved, roundish-cordate, sometimes with a few sharpish lobes, irregularly and coarsely toothed; upper side rough, under harshly tomentose: peduncles several together, axillary, about half as long as the petiole, 3–4-flowered: sepals oblong, about thrice the length of the oblong entire petals: torus scarcely longer than the glands: style about the length of the stamens: drupes 4-lobed, pubescent and hairy, when ripe sometimes nearly glabrous; nuts 4 (or fewer by abortion), 1–2-celled.—*Juss. in ann. mus.* 4. *p.* 92; *DC. prod.* 1. *p.* 511; *Spr. syst.* 2. *p.* 581; *Wall.! L. n.* 1092; *Wight! cat. n.* 254.—G. aspera, *Roxb. fl. Ind.* 2. *p.* 590; *in E. I. C. mus. tab.* 228; *Roth. nov. sp. p.* 245; *DC. prod.* 1. *p.* 511; *Spr. syst.* 2. *p.* 581.—G. macrophylla, *G. Don in Mill. dict.* 1. *p.* 549.

++ Leaves 5-nerved.

288. (12) G. *villosa* (Herb. Miss.:) leaves 5-nerved, roundish-cordate with or without a short acumination, wrinkled, toothed, teeth terminated by a tuft of hairs; upper side rough, under covered with a short tomentum and villous on the nerves and veins: inflorescence, petioles, and young leaves very villous: peduncles scarcely any; pedicels umbellate, 5–6 in each axil, shorter than the petiole: sepals linear-lanceolate, about thrice the length of the oblong entire obtuse petals: torus not longer than the glands: style thickened at the apex, longer than the stamens: lobes of stigma toothed: drupe globose, hairy; nuts 4, each 1-celled.—*Herb. Rottl.!, Klein!, and Heyne!; Willd.; Sm.! in Rees' cycl; Roth. nov. sp. p.* 248; *DC. prod.* 1. *p.* 512; *Spr. syst.* 2. *p.* 581 (excl. syn. *Roxb.*); *Wall.! L. n.* 6306; *Wight! cat. n.* 265.—G. orbiculata, *G. Don in Mill. dict.* 1. *p.* 551 (not *Rottl.*)

It is singular that, although discovered by the Missionaries in August 1798, no trace of this occurs in Roxburgh's works. Willdenow has led Mr Don into an error by erroneously quoting for this the *G. orbiculata* of Rottler, which belongs to *G. rotundifolia.*

289. (13) G. *Asiatica* (Linn.:) arborescent: leaves 5-nerved, roundish-cordate

Digitized by Google

obtuse or acutish, sometimes unequal at the base, unequally serrated; upper side at length nearly glabrous, under glabrous pubescent or hoary: stipules lanceolate-subulate: peduncles axillary, 2–4, twice or thrice as long as the petiole, 3-flowered, and as well as the pedicels divaricating: sepals oblong-lanceolate, twice the length of the narrow-obovate petals: torus scarcely longer than the glands: style about equal to the stamens; stigma 4-lobed: drupes globose, with 1–2 1-celled nuts.—*DC. prod.* 1. *p.* 511; *Spr. syst.* 2. *p.* 581; *Roth. nov. sp. p.* 251; *Roxb.! fl. Ind.* 2. *p.* 586; *in E. I. C. mus. tab.* 223; *Wall.! L. n.* 1089; *Wight! cat. n.* 255.—G. subinæqualis, *DC. prod.* 1. *p.* 511.

There are before us so many variations in the form of the leaves and pubescence, that we cannot point out any constant characters but in the fruit.

290. (14) G. *tiliæfolia* (Vahl:) arborescent: leaves 5-nerved, roundish-cordate, rounded or acuminated at the apex, usually oblique at the base, equally or unequally bluntly toothed or serrated; upper side at length glabrous, under glabrous or sometimes densely pubescent: stipules lanceolate, auricled on one side at the base: peduncles axillary, numerous, from half as long as the petiole to sometimes nearly equal to or even slightly exceeding it, 3–5-flowered, straightish as well as the pedicels: sepals linear-oblong, twice as long as the oblong petals: torus scarcely exceeding the glands: style about the length of the stamens; stigma 4-lobed: drupes 2-lobed; lobes globose, with two hemispherical 3-celled nuts, or one spherical 6-celled nut, in each lobe.—*Vahl symb.* 1. *p.* 35; *Roth. nov. sp. p.* 251; *DC. prod.* 1. *p.* 511; *Spr. syst.* 2. *p.* 581; *Roxb. fl. Ind.* 2. *p.* 587; *Wall.! L. n.* 1094; *Wight! cat. n.* 266.—G. arborea, *Roxb. in E. I. C. mus. tab.* 227; *Roth. nov. sp. p.* 247; *Spr. syst.* 2. *p.* 581.—G. variabilis, *Wall.! L. n.* 1087. *c.*

We have not seen Wall. L. n. 1087. *a* or *b*, and do not know whether they be referable to this or to the last species. Most authors proceed on the supposition that Roxburgh's *G. arborea* is distinct from *G. tiliæfolia;* but Roxburgh only called it so before Vahl's description reached him, when he adopted Vahl's name both in his Hort. Bengh. and Fl. Ind. It is strange that G. Don (in Mill. dict.) should refer to the Hort. Bengh. p. 92, for *G. arborea,* no such occurring, the name *tiliæfolia* being even there (at p. 93) printed by mistake *trifolia.*

291. (15) G. *rotundifolia* (Juss.:) leaves 5–6-nerved, cordate-roundish or ovate, equal or oblique at the base, crenulated, hoary and softly velvety on both sides: peduncles axillary, several together, several times longer than the petioles, 3-flowered; pedicels divaricating: sepals linear, 2–3 times as long as the oblong slightly bidentate petals: torus scarcely exceeding the glands: style longer than the stamens; stigma 4-lobed and crenulated: drupes slightly 2-lobed, with 1–2 usually 2-celled nuts in each.—*Juss. ann. mus.* 4. *p.* 92. *t.* 50. *f.* 3; *DC. prod.* 1. *p.* 511; *Spr. syst.* 2. *p.* 581; *Wall.! L. n.* 1085; *Wight! cat. n.* 263, 268.—G. orbiculata, *Herb. Miss.!; Roth. nov. sp. p.* 246.—G. orbicularis, *Herb. Lamb.; G. Don in Mill. dict.* 1. *p.* 550.

292. (16) G. *populifolia* (Vahl:) shrubby: leaves 5-nerved, roundish, slightly cordate at the base, unequally crenated; upper side nearly glabrous, under pubescent: petioles slender: peduncles axillary, solitary, 1-flowered, shorter than the leaf, with two opposite bracteoles above the middle: sepals linear, a little longer than the stamens and narrow linear bifid petals: torus scarcely exceeding the glands: ovarium glabrous: style a little longer than the stamens; stigma 4-lobed: drupes deeply 2-lobed; lobes globose with a shining, glabrous crustaceous epicarp, and 1 1-celled nut in each.—*Vahl symb.* 1. *p.* 33; *DC. prod.* 1. *p.* 511; *Spr. syst.* 2. *p.* 581; *Wight! cat. n.* 267.—G. betulæfolia, *Roth. nov. sp. p.* 249; *Wall.! L. n.* 1088.—Chadara tenax, *Forsk.!*

Roth states that the petals are obtuse; our specimens, from the same source, have the points bifid. We had no opportunity of dissecting Forskahl's plant, but it appeared quite the same as ours, as did also *G. populifolia* of

Digitized by Google

Vahl in Herb. Banks, and Herb. Smith. We possess this from the Mauritius: it is Sieber's Flora mixta, n. 113.

§ 2. *Inflorescence panicled, terminal, or in the axils of the upper leaves: petals with a nectariferous cavity: ovarium of* 3 *united carpels.* Microcos, *Linn.*

293. (17) G. *Microcos* (Linn.!:) shrubby: leaves ovate- or obovate-lanceolate, acuminated, slightly cordate at the base, serrulated, reticulately veined or wrinkled, adult ones glabrous or nearly so; under side of young ones covered with a starry pubescence: panicle terminal, pubescent: flowers 2 or 3 together within an involucrum: petals broad-oblong, 3 times shorter than the calyx, emarginate at the apex; the nectariferous cavity with a pubescent margin, containing a small close-pressed gland at the base: drupe with a single, hairy, 3-celled nut.—*DC. prod.* 1. *p.* 510; *Spr. syst.* 2. *p.* 579; *Wall.! L. n.* 1098; *Wight! cat. n.* 264.—G. ulmifolia, *Roxb.! hort. Bengh. p.* 42; *fl. Ind.* 2. *p.* 591; *in E. I. C. mus. tab.* 1983.—G. affinis, *Lindl.! in Hort. Soc. Trans.* 6. *p.* 265.—Microcos paniculata, *Linn.!*—M. mala, *Ham.! in Linn. Soc. Trans.* 13. *p.* 549.—M. Stauntoniana, *G. Don in Mill. dict.* 1. *p.* 551.—Arsis rugosa, *Lour. fl. Cochin. p.* 409.—*Burm. fl. Zeyl. t.* 74; *Pluk. t.* 262. *f.* 3; *Rheed. Mal.* 1. *t.* 56.

IV. BERRYA. *Roxb.*

Sepals 5, united in æstivation, bursting irregularly into 3, 4, or 5 segments, somewhat persistent. Petals 5, oblong. Stamens numerous; filaments slightly united at the very base. Ovarium solitary, 3-lobed, 3-celled: ovules 6–8 in each cell, in a double series. Style simple. Stigma 3-lobed. Capsule roundish, 6-winged, 3-celled, 3-valved, loculicidal: each valve furnished with two large, oblong, membranaceous, reticulated, horizontal, villous wings. Seeds 1–4 in each cell, densely covered with short rigid hairs: albumen fleshy: radicle superior.—A tree. Leaves alternate, petioled, with ensiform deciduous stipules, cordate-ovate, acuminated, glabrous, 5–7-nerved at the base. Panicles terminal and axillary, large. Flowers numerous, white.

* 294. (1) B. *Ammonilla* (Roxb.)—*Roxb. hort. Bengh. p.* 42; *fl. Ind.* 2. *p.* 639; *Cor.* 3. *t.* 264; *DC. prod.* 1. *p.* 517; *Spr. syst.* 2. *p.* 582; *Wall.! L. n.* 1068; *Wight! cat. n.* 252.——Cultivated in the governor's garden at Madras, from Ceylon, but probably a native also of the southern provinces of the Peninsula.

The wood is annually exported in large quantities from Trincomalee, and hence called Trincomalee wood. The Singalese name is said by Roxburgh to be Ammonilla, but we do not find it in Moon's catalogue of Ceylon plants.

ORDER XXVI.—ELÆOCARPEÆ. *Juss.*

Sepals 4–5, without an involucrum: æstivation valvate. Petals 4–5, hypogynous, very rarely perigynous or none: æstivation imbricated. Torus large, discoid, usually with glands, generally free, rarely lining the bottom of the calyx. Stamens hypogynous or rarely perigynous, some multiple of the sepals (8–80): filaments short, free: anthers long, bilocular, opening at the apex by a double fissure. Ovary with two or more cells: style 1 and simple or rarely trifid, very rarely 4: stigmas equal to the number of carpels, frequently united. Fruit various, indehiscent, dry, drupaceous, or valvular and loculicide, sometimes by abor-

Digitized by Google

tion 1-celled. Seeds 1 or 2 (rarely more?) in each cell. Albumen fleshy. Embryo inverted: cotyledons flat, foliaceous: radicle superior. —Leaves alternate or opposite, with deciduous stipules. Petals 3-lobed or fimbriated, rarely only emarginate.

I. ELÆOCARPUS. *Linn.; Lam. ill. t.* 459; *Gærtn. fr. t.* 43.

Calyx 4–5-sepaled. Petals 4–5, glabrous on the back, cuneate, ciliated below, 3–5-cleft and laciniated towards the apex. Stamens 15–50, inserted into the upper and inner side of the glands of the torus: anther-valves equal, obtuse, usually bearded at the tip with several short pellucid bristles. Ovarium surrounded at the base by 5 large glands, 3-celled: ovules 2 in each cell. Fruit a drupe: nut tubercled, 3-, or by abortion 1-celled; seed solitary in each cell.—Trees or large shrubs. Leaves lanceolate, usually serrated.

To this genus, formed for *E. serratus*, belongs De Candolle's *Aceratium*, the character he has given to *Elæocarpus* corresponding principally to *Monocera*. We incline with Jussieu to keep *Ganitrus* (*El. Ganitrus*, Roxb.) distinct, on account of the 5-celled ovarium, with 4 ovules in each cell; with it *El. nitidus* of Jack is a congener. *Elbifidus*, Hook. and Arn., and *Dicera dentata*, Forst., having 2- or 3-lobed petals and a 2-celled ovary, may also form the type of a genus, although the one has 2 unequal pointed, and the other 2 retuse anther-valves: to the former, *Acronidia* Bl. is very closely allied. *Dicera serrata* Forst. has sometimes, if not always, unisexual flowers, and has little affinity with any genus we know except perhaps *Aristotelia*. *Decadia* Lour. appears to be a species of *Symplocos*.

295. (1) E. *serratus* (Linn.:) arborescent: leaves petioled, alternate, elliptical, obtuse, bluntly serrated; nerves with glands in their axils and at most of their subdivisions: petioles with a small gland on each side near the apex: racemes simple, from the axils of the present year's leaves, and scarcely so long: stamens 20–30; anther-valves bearded: drupes oblong; nut oblong, very hard, indehiscent, prominently tubercled, 1-celled, 1-seeded.—*Linn. sp. pl. p.* 734; *Sm.! in Rees' cycl.; Spr. syst.* 2. *p.* 449 (bad as to numb. of stam.); *Wall.! L. n.* 2666. *f*; *Wight! cat. n.* 290.—E. integrifolius, *Lam. ill. t.* 459; *DC. prod.* 1. *p.* 519; *Spr. l. c.*——Malabar, Travancore.

De Candolle's character of this species, with the synonyms of Rumphius and Gærtner belong to the genus *Ganitrus:* the plant he saw in Burmann's herbarium, to the next species. In *E. integrifolius*, Lam., the serratures are more shallow than usual.

296. (2) E. *oblongus* (Gærtn.:) arborescent: leaves petioled, alternate, elliptic-oblong, pointed, with blunt and often shallow serratures; nerves with glands in some of the axils, or often without any: petioles with a small gland on each side near the apex: racemes simple, from the axils of the fallen leaves, and considerably shorter than them: stamens 30–40; anther-valves beardless: drupes oblong; nut oblong, very hard, indehiscent, prominently tubercled, 1-celled, 1-seeded.—*Gærtn. fr. t.* 43; *Sm.! in Rees' cycl.; DC. prod.* 1. *p.* 519.—E. Perim-Kara, *DC. l. c.*—*Rheed. Mal.* 4. *t.* 24 (bad); *Burm. Zeyl. t.* 40; *Rumph. Amb.* 3. *t.* 102 (bad).—*α*; leaves very shortly pointed: racemes about two-thirds of the length of the leaves; pedicels stout.—*Wight! cat. n.* 291.—*β*; leaves with a longish acumination, twice as long as the racemes; pedicels slender.—*Wight! cat. n.* 293.——*α*; Neelgherries. *β*; Southern provinces.

Of the synonym of Smith we feel certain; and we have little doubt as to Rumphius, that author nowhere saying that the leaves are entire, but that the margins are "obscurely and amply toothed."—*E. serratus*, Roxb.! (fl. Ind. 2. p. 596, and E. I. C. mus. tab. 951), Wall.! L. n. 1666. *a*, *c*, *k*, and apparently also of Blume, is a closely allied species to the present, having the same foilage, but differing by the anthers bearded, by the indehiscent

Digitized by Google

nuts 2–3-celled, 2–3-seeded, and "smooth except for small pits like those of the almond."

† 297. (3) E. *adenophyllus* (Wall.)—*Wall. L. n.* 6860.—Olea? serrata, *Herb. Heyne.*

II. MONOCERA. *Jack.*

Calyx 5-sepaled. Petals 5, cuneate, usually silky on the back, 3–5-cleft and much laciniated towards the apex. Stamens numerous (25–80): anther-valves unequal; outer one elongated, tapering and subulate, much longer than the inner one. Ovarium surrounded at the base by 5 glands, 2-celled: ovules numerous, in a double row in each cell. Fruit a drupe: nut smoothish or tubercled, 1–2-celled. Seeds solitary in each cell.—Trees. Leaves lanceolate or cuneate-oblong, serrated or entire.

To this genus Jack (in Mal. misc. 1. n. 2. p. 41, and in Hook. bot. misc. 2. p. 85) has referred several species, principally, at the time, undescribed. To it also belongs *El. Varunua*, Ham.! (*E. serratus*, Wall.! L. n. 2666, *g*, *h*.)

298. (1) M. *tuberculata* (W. & A.:) arborescent: leaves petioled, cuneate-obovate, retuse at the base, remotely serrulated: racemes lax, simple, solitary from the axils of the fallen leaves; pedicels slender, drooping: petals silky on the back: stamina 70–80; filaments hairy: drupe oval; nut compressed, much tubercled on each of the flat sides, with a thickened margin, 1–2-celled. —E. tuberculatus, *Roxb. hort. Bengh. p.* 93; *fl. Ind.* 2. *p.* 594; *Wall.! L. n.* 2658; *Wight! cat. n.* 292.—E. serrulatus, *Roxb. hort. Bengh. p.* 42.—E. bilocularis, *Roxb. in E. I. C. mus. tab.* 1985; *Jack, l. c.*——Neelgherries, Travancore.

ORDER XXVII.—DIPTEROCARPEÆ. *Blume.*

Calyx tubular, 5-lobed, naked, persistent, usually unequal, and afterwards enlarged: æstivation imbricated. Petals hypogynous, sessile or scarcely unguiculate, often slightly connected at the base: æstivation twisted. Stamens indefinite, hypogynous: filaments dilated at the base, free or irregularly cohering: anthers erect, bilocular, acuminated or tipped with a gland or subulate point, opening by terminal fissures. Torus small, not discoid. Ovarium with few cells: ovules in pairs, pendulous: style and stigma simple. Fruit coriaceous, 1-celled by abortion, 3-valved or indehiscent, surrounded by the calyx. Seeds solitary. Albumen none. Radicle superior, or rarely (ever?) inferior: cotyledons thick and fleshy, twisted and crumpled, or unequal and obliquely incumbent.—Trees abounding in resin. Leaves alternate: vernation involute. Stipules deciduous, convolute.

I. VATERIA. *Linn.; Lam. ill. t.* 475; *Gærtn. fr. t.* 189.

Calyx 5-partite: segments sometimes afterwards enlarged, equal. Petals 5. Stamens 15–50: anthers tapering. Ovarium 3-celled, with 2 pendulous ovules in each cell. Seed solitary: cotyledons stalked: radicle superior.—Trees. Leaves oblong, entire, coriaceous, glabrous. Panicles axillary or terminal, with white flowers.

299. (1) V. *Indica* (Linn.:) panicles terminal: calyx-segments oblong, obtuse, not enlarged when in fruit: petals oval, emarginate, scarcely longer

Digitized by Google

than the calyx: stamens 40–50; anther-cells linear; connectivum produced beyond them into a subulate point, splitting along with the anthers: style elongated; stigma acute.—*Roxb. Cor.* 3. *t.* 288; *fl. Ind.* 2. *p.* 602; *Spr. syst.* 2. *p.* 599; *Wall.! L. n.* 3670; *Wight! cat. n.* 289.—Elæocarpus copalliferus, *Retz.*—*Rheed. Mal.* 4. *t.* 15.——Malabar.

V. lanceolata, Roxb., ought perhaps to form a distinct genus: as a species it differs by the panicles axillary; calyx-segments ovate, acute, and much increased as the seeds ripen; petals linear-falcate, obtuse, with their concave bases placed closely together and forming a kind of tube round the ovary and stamens; stamens 15, anther-cells short with the connectivum produced beyond them into an ovate, acute, indehiscent coloured glandular point; style short, stigma clavate 3-dentate.

II. VATICA. *Linn.*—Shorea, *Roxb.*; *Gærtn. fr. t.* 186.

Sepals 5, afterwards enlarging into 5 long wings. Petals 5. Stamens 15–100: filaments capillary below the anthers: anther-cells short, obtuse; connectivum filiform, produced beyond the cells into a more or less elongated, coloured, deciduous bristle. Ovarium 3-celled, with two pendulous ovules in each cell. Seed solitary: cotyledons stalked, not crumpled: radicle superior.—Trees with entire leaves, and panicles of yellow flowers.

300. (1) V. *laccifera* (W. & A.:) glabrous: leaves coriaceous, oblong, obtuse, often emarginate at the base: panicles numerous, from the axils of the fallen leaves; branches and pedicels glabrous: calyx in flower glabrous: stamens 15; anther-bristle very long.—*Wight! cat. n.* 960.—Shorea Talura, *Roxb. hort. Bengh. p.* 93; *fl. Ind.* 2. *p.* 618.—S. laccifera, *Heyne; Wall.! L. n.* 967.—S. Roxburghii, *G. Don? in Mill. dict. p.* 813.—S. robusta, *Roth. nov. sp. p.* 221 (not *Roxb.*).—Saul Iallarea, *Roxb. in E. I. C. mus. tab.* 1567.—— Naikeneri, upon the Ghauts. Nundidroog. Paulghaut-mountains.

As there is some uncertainty about the Tamul name of the plant, (whether, as Roxburgh says, it be *Talura* (in his mss. *Iallarea*), or, as Wallich has it, *Galari-maram*), we have adopted the less barbarous specific one of *laccifera*. With this species it is most probable that *V. chinensis*, Linn. (a name inadmissible, as it is not a native of China), is identical: indeed we know of no distinguishing character.

†301. (2) V. *Tumbugaia* (W. & A.:) leaves ovate-cordate, long-petioled: panicles terminal: stamens about 100, with bearded anthers.—Shorea Tumbugaia, *Roxb. fl. Ind.* 2. *p.* 617.—Saul Tumbugaia, *Roxb. in E. I. C. mus. tab.* 1566.——Balaghat or Paulghaut mountains; *Dr Berry.*

III. DIPTEROCARPUS. *Gært. fr. t.* 187, 188.

Calyx of one piece, 5-cleft: two of the segments, when in fruit, expanded into long ligulate scarious wings. Petals 5. Stamens numerous: anthers long, linear, tapering. Ovarium 3-celled, with two pendulous ovules in each cell. Seed solitary: cotyledons crumpled: radicle superior.—Large trees. Flowers in racemes, white tinged with red.

D. incanus, Roxb. fl. Ind. 2. p. 614, and *D. alatus*, Wall.! L. n. 953. *b.* (not Roxb.), having ovate leaves softly pubescent beneath, with strongly marked lateral nerves, and a glabrous calyx, appear to belong to the true *D. costatus*, Gærtn., according to Hamilton's description of the plant of which Gærtner represented the fruit. Roxburgh's *D. costatus*, with linear-oblong leaves and a slightly hairy calyx, is a distinct species, and may be called *D. angustifolius*. *D. alatus*, Roxb. is very closely allied to *D. scaber*, Ham., and may be the same; but the latter is said to have the leaves scabrous on both sides with fascicled hairs; and the former, smooth and opaque above, and harsh underneath. As we have no means of ascertaining whether the plant in Wall. L. n. 952. *b*, be the *D. turbinatus* of Roxburgh or of Gærtner, we shall here insert both.

Digitized by Google

* 302. (1) D. *lævis* (Ham.:) young branches compressed, 2-edged: leaves ovate or oblong-ovate, retuse at the base, acute, shining on both sides, with numerous prominent veins: petioles glabrous: tube of the enlarged calyx slightly ventricose but scarcely contracted below the limb, even (without angles): capsule ovate, even.—*Ham. in Wern. Soc. Trans.* 6. *p.* 299.—D. turbinatus, *Roxb. Cor.* 3. *t.* 213; *fl. Ind.* 2. *p.* 612; *Wall. L. n.* 952. *a.*

* 303. (2) D. *turbinatus* (Gærtn.:) young branches terete: leaves ovate, acute, pubescent on both sides, but particularly towards the margin, with numerous slightly prominent veins: petioles pubescent: tube of the enlarged calyx turbinate, much contracted below the limb, even (without angles): capsule ovate, marked with 6 (occasionally 8) furrows.—*Gærtn. fr.* 3. *p.* 51. *t.* 188; *Ham. in Wern. Soc. Trans.* 6. *p.* 299; *Moon? cat. Ceyl. pl. p.* 42.—Caryolobis indica, *Gærtn.? fr. t.* 45.

This species yields almost no oil, and is used in Chittagong for the construction of litters: *D. lævis* yields abundance of oil.

IV. HOPEA, *Roxb.*

Sepals 5, two or sometimes three of them afterwards enlarging into long wings. Corolla of one piece (gamopetalous); tube campanulate; segments of the limb oblique, linear, oblong, spreading, twisted. Stamens 15: filaments 10, alternately simple and bifid: anthers 15; cells short, obtuse; connectivum produced beyond the cells into a longish deciduous bristle. Ovarium 3-celled, with two pendulous ovules in each cell. Seed solitary: radicle superior.—Trees. Leaves entire, often with glands in the axils of the nerves. Panicles axillary or terminal, composed of alternate bifarious ramifications. Flowers small, yellow, fragrant, secund and nearly sessile on the branches of the panicle.

Dammara Selanica, Rumph. Amb. 2. p. 168. t. 56, or *Unona? Selanica*, DC. prod. 1. p. 96, certainly belongs to this genus, notwithstanding it differs from all the other species by 3, not 2, of the sepals becoming enlarged.

304. (1) H. *Wightiana* (Wall.:) leaves ovate-oblong, obtuse, glabrous: branches of the panicle and calyx glabrous: two of the segments of the fructiferous calyx expanded into wings, oblong, obtuse: capsule oblong-ovate, acute.—*Wall.! L. n.* 6295; *Wight! cat. n.* 961.

305. (2) H. *glabra* (W. & A.:) young branches and petioles glabrous: leaves oblong, acuminated, without glands in the axils of the nerves beneath: panicles axillary and terminal, several together, longer than the leaves, glabrous; peduncles compressed.—*Wight! cat. n.* 360.

Our specimens are exceedingly imperfect, but we can scarcely refer them to *H. Wightiana*, although in the absence of fruit the chief difference lies in the glabrous, not pubescent, young branches, and much narrower leaves.

ORDER XXVIII. TERNSTRŒMIACEÆ. *Mirb.*

Sepals 3–5, concave, coriaceous, persistent, the innermost often the largest: æstivation imbricated. Petals hypogynous or very rarely (in *Annesleya*) perigynous, 5 (rarely more or fewer), often combined at the base, alternate with the sepals. Stamens inserted with the petals, indefinite: filaments often cohering at the base into 1 or more parcels, and united to the petals. Ovary ovate, plurilocular, usually sessile on a discoid torus: ovules 2 or more in each cell: styles 2–7, distinct or

Digitized by Google

more or less combined. Fruit 2–5-celled, coriaceous and indehiscent, or capsular and opening by valves. Seeds few and large, rarely numerous, sometimes arillate. Albumen fleshy or wanting. Embryo either straight, or bent, or folded back: radicle usually long and slender, turned towards the hilum: cotyledons large, oblong, sometimes longitudinally plaited, often containing oil.—Leaves alternate, coriaceous, exstipulate, now and then pellucido-punctate. Petioles jointed at the base. Peduncles axillary and terminal. Flowers usually handsome.

In addition to the following, Dr Wallich (L. n. 3723.) enumerates *Ternstræmia crenulata* from the Herb. Madr., with which we are not acquainted.

I. EURYA. *Thunb.*

Flowers polygamous or dicœcious. Calyx 5-partite, with 2 bracteoles at its base. Petals 5, more or less united at its base into a gamopetalous corolla, opposite to the segments of the calyx: æstivation imbricated. Stamens 12–15, or more, attached to the base of the corolla in a single series: filaments distinct: anthers adnate, dehiscing longitudinally, often terminated by a short point formed by the excurrent connectivum. Disk none under the ovary. Styles 3–5, distinct almost from the base, or united to near the apex. Stigmas 2–5, distinct. Fruit baccate, indehiscent, 2–5-celled, many-seeded. Seeds several in each cell, in a double series, with a shining crustaceous dotted testa: albumen none: embryo cylindrical, uncinate.—Evergreen shrubs, with axillary peduncles. Flowers small, white.

306. (1) E. *Wightiana* (Wall.:) ultimate branches glabrous: leaves cuneate-obovate, with a short blunt point, entire towards the base, sharply serrated upwards, glabrous: peduncles 1–3 together, very short: styles 3, united to near the apex into one bearing 3 stigmas.—*Wall.! L. n.* 3662; *Wight! cat. n.* 297.—E. fasciculata, *Wall.! L. n.* 4399?

We cannot distinguish the Silhet plant from ours; but, as the specimen in Mr Arnott's herbarium is imperfect, we prefer leaving it with a mark of doubt.

307. (2) E. *tristyla* (W. & A.:) ultimate branches glabrous: leaves oblong-lanceolate, acuminated, cuneate and entire at the base, sharply serrated upwards, glabrous: peduncles 1–3 together, very short: styles 3, distinct.—*Wight! cat. n.* 298.—Geeria glabra, *Blume.*

308. (3) E. *angustifolia* (Wall.:) ultimate branches hairy: leaves linear-lanceolate, acuminated, sharply serrated upwards, under side of young ones sprinkled with hairs; midrib beneath pubescent: flowers 2–3 together in the axils of the leaves, nearly sessile: styles combined.—*Wall.! L. n.* 1465; *Wight! cat. n.* 963.

We are uncertain whence the specimen in Dr Wight's herbarium was obtained. It seems to us to present no essential difference from Wallich's plant in Mr Arnott's herbarium; but as Wallich's is from Penang, perhaps the present species may be *E. bifaria*, Wall.

† 309. (4) E. *bifaria* (Wall.)—*Wall. L. n.* 3721.

II. CLEYERA. *Thunb.*

Calyx of 5 sepals, with 2 bracteoles at the base. Petals 5, distinct, with a broad base, alternate with the sepals: æstivation imbricated. Stamens distinct, adhering to the base of the petals: anthers adnate, linear, dehiscing

Digitized by Google

longitudinally. Style single, crowned by 2–3 stigmas. Fruit baccate, 2–3-celled. Seeds 2 in each cell, pendulous from the summit of the axis, wingless: albumen fleshy: embryo curved.—Evergreen shrubs with axillary peduncles. Flowers of a moderate size, white or yellowish.

310. (1) C. *gymnanthera* (W. & A.:) glabrous: leaves cuneate-obovate, obtuse or shortly and obtusely pointed, coriaceous, entire: peduncles twice as long as the petioles, 2-edged: bracteoles persistent: anthers dotted with little points on the connectivum, without bristles.—*Wight! cat. n.* 300.

Formerly sent to Dr Wallich, marked "*Mesua?*" but we do not find it noticed in his List. It is closely allied to *C. ochnacea* β, DC., and Wall.! L. n. 1460 (*C. ochnoides* and *C. Lushia* of G. Don in Mill. dict. 1. p. 566), but the flowers in that species are smaller, the bracteoles caducous, and its anthers retrorsely hispid. *C. Millettii*, Hook. and Arn. in Bot. Beech. Voy. p. 271, is also readily distinguished by bristles on the anthers pointing upwards.

III. COCHLOSPERMUM. *Kunth.*

Calyx of 5 oval, oblong, unequal sepals, at length reflexed; the two exterior smaller: bracteoles none. Petals 5, emarginate, unequal-sided: æstivation twisted. Stamens numerous: anthers linear-acuminated, attached by the base, opening by a pore at the apex. Ovary seated on an elevated disk. Styles united to the apex into one long and filiform. Capsules shortly obovate, 3–5-celled, 3–5-valved: valves bearing incomplete dissepiments in the middle. Seeds numerous, somewhat reniform, covered with cotton: albumen fleshy: embryo slender.—Trees or shrubs. Leaves lobed. Flowers large, yellow, panicled, with the peduncles jointed at the base.

311. (1) C. *Gossypium* (DC.:) leaves palmately 5-lobed; lobes acuminated, quite entire; upper side becoming glabrous; under tomentose.—*DC. prod.* 1. *p.* 527; *Spr. syst.* 2. *p.* 596; *Wall.! L. n.* 1843; *Wight! in Hook. bot. misc.* 2. *suppl. t.* 18; *Wight! cat. n.* 301.—Bombax Gossypium, *Linn.; Cav. diss.* 5. *t.* 157; *Roxb. in E. I. C. mus. tab.* 661.——Coromandel. Travancore.

IV. GORDONIA. *Ellis.*

Calyx of 5 rounded coriaceous outwardly-silky sepals, with similar external deciduous bracteoles. Petals 5, connected together at the base. Stamens numerous: filaments united at the base with the claws of the petals (and hence monadelphous or somewhat 5-adelphous, according to the degree of union among the claws of the petals): anthers ovate, oscillatory. Styles combined to the apex, crowned with a peltate 4–5-lobed stigma. Capsules 4–5-celled, 4–5-valved, loculicidal. Seeds 2–4 in each cell, attached to the central column, terminated by a leafy wing: albumen none: embryo straight: radicle oblong: cotyledons foliaceous, wrinkled and plaited lengthwise.—Trees or shrubs, with the appearance of *Camellia* or *Thea*. Peduncles axillary, 1-flowered.

312. (1) G. *obtusa* (Wall.:) leaves cuneate-oblong, obtuse or with a blunt acumination, with shallow serratures, glabrous: peduncles short, not so long as the petioles: petals obcordate, slightly united at the base: stamens somewhat pentadelphous.—*Wall.! L. n.* 1459; *Wight! cat. n.* 342.——Neelgherries.

Digitized by Google

ORDER XXIX.—OLACINEÆ. *Mirb.*

Calyx small, of one piece, entire or toothed, often finally becoming large. Petals hypogynous, 3–6, distinct or adhering in pairs: æstivation valvate. Stamens hypogynous or combined with the petals, (fertile) definite, 3–10, opposite to the petals when symmetrical, or all or partly alternate when not symmetrical, sometimes mixed with others that are sterile and opposite to the petals: filaments compressed: anthers erect, bilocular, bursting longitudinally. Ovarium 1–3–4-celled: ovules 3–4, pendulous from the top of a central placenta, or from the apex of the cells: style simple: stigma 3–4-lobed. Fruit drupaceous, indehiscent, often surrounded by the enlarged calyx, 1-celled, 1-seeded. Seed usually pendulous. Albumen copious, fleshy. Embryo with the radicle next the hilum.—Leaves simple, alternate, exstipulate, sometimes abortive.

The stamens in this order are normally twice as many as the petals, and are placed in pairs opposite to them, as in *Ximenia* and *Heisteria*: half of them are sometimes sterile, as in *Pseudaleia*, in which genus the petals adhere in pairs to the very top. The fertile and sterile do not alternate singly, but by pairs. When the petals are combined, the fertile stamens are sometimes reduced in number as in *Olax*; single filaments bearing single anthers (not double filaments with 4-celled anthers, as might have been expected,) taking occasionally the place of two contiguous fertile ones, assist to unite the corresponding petals together; the broad filament being applied partly along the margins of both: in *O. Wightiana*, we observe a partial recurrence to the normal or symmetrical state, there being occasionally 4 fertile stamens in the flower, two of them being placed as in *Pseudaleia*, one within the margin of each of the two contiguous combined petals, nearly where a single one is found in the usual state of the species of *Olax*.

I. OLAX. *Linn.; Gærtn. fr.* 3. *t.* 201.

Calyx entire, small whilst flowering. Petals 5, four united by pairs to the middle, and the fifth distinct; or occasionally 6, and all united by pairs. Fertile stamens 3, occasionally 4 or 5; anthers ovate, versatile: sterile ones as many as the petals: both kinds combined with the petals to about half their length. Ovarium 1-celled, with 3 pendulous ovules. Style elongated. Stigma 3-lobed. Fruit a dry 1-seeded drupe, contained within the free, enlarged, cup-shaped, dry calyx: nut crustaceous. Seed umbilicated, and slightly 3-lobed at the base. Embryo at the end of the albumen next the style: radicle superior.—Trees or shrubs. Leaves quite entire.

Brown (prod. fl. Nov. Holl. p. 357), and Ach. Richard (Dict. class. d'Hist. Nat.), attribute to this genus a *cylindrical* embryo in the axis of the albumen: we also find a cavity in the axis, but it seems to us filled with camphor, while the embryo is minute in another apparently distinct and small cavity: but the fruit before us is not quite ripe. *Olax*, such as we have described it, has all the stamens epipetalous: the New Holland species, if De Candolle be correct, has one, at least, of the stamens hypogynous, and the peduncles 1-flowered; but if *Spermaxyrum* be kept a distinct genus for them, it cannot contain *O. nana*, Wall.! L. n. 6783, which has a similar habit, and also 1-flowered peduncles, but has often 6 petals, and the epipetalous stamens and bifid sterile anthers of the other E. Indian species.

† 313. O. *Zeylanica* (Linn.:) arborescent, erect: young branches acutely angled, glabrous, transversely rugulose: leaves glabrous, ovate-acuminated: racemes axillary, few-flowered: pedicels short: sterile filaments with their

Digitized by Google

upper part (sterile anthers) bifid.—*DC. prod.* 1. *p.* 532; *Spr. syst.* 1. *p.* 175; *Wall. L. n.* 6776; *Wight! cat. n.* 302.

314. (2) O. *scandens* (Roxb.:) large climbing shrub: thorns here and there on the old woody parts: branches terete, young ones pubescent: leaves oval, usually more or less pubescent on the under side: racemes axillary, solitary, pubescent, simple: pedicels at first much shorter than the subtending bractea, at length scarcely twice as long: petals occasionally 6, usually 5: sterile stamens with their upper part (the sterile anther) bifid.—*Roxb. Cor.* 2. *t.* 102; *fl. Ind.* 1. *p.* 162; *Roxb. and Wall. fl. Ind.* 1. *p.* 168; *Wall.! L. n.* 6774; *Wight! cat. n.* 303.—O. Bador, *Ham.! in Wall. L. n.* 6778.—O. Psittacorum, *Vahl, en. p.* 34 (as to his second variety).—O. obtusa, *Blume?*—Roxburghia baccata, *Koen.*——Coromandel.

315. (3) O. *Wightiana* (Wall.:) branches terete, glabrous: leaves ovate or oblong, quite glabrous; upper side shining, under pale: racemes axillary, often several together, lax, usually compound: pedicels always many times longer than the subtending bractea: petals usually 5: sterile anthers, bifid.—*Wall.! L. n.* 6779; *Wight! cat. n.* 304.—O. Psittacorum, *Vahl en.* 2. *p.* 33 (as to the Ceylon plant and greater part of the descr.)——Southern provinces.

Readily distinguished from the two former by the lax racemes, and flowers double the size. In this one the pedicels seem to be inserted on the peduncles without order, and are never imbricated with bracteas longer than themselves: in the other two the pedicels are distichously inserted, close, and covered each with a bractea, although the regular "bifariously imbricated" appearance (compared by Roxburgh, under *O. imbricata*, to the spikelets of a *Briza*) be not readily perceived owing to the lower pedicels in each raceme being in fruit, before the upper flowers expand. In all the three species the *sterile anthers* are cleft to the middle, the segments parallel and close to each other, and by no means as they are represented by Roxburgh (Cor. t. 102). *Fissila Psittacorum*, Lam. ill. t. 28, appears to differ from *O. Wightiana*, by the entire sterile anthers.

†316. (4) O. *lucida* (Heyne.)—*Wall. L. n.* 6777.

†317. (5) O. *Heyneana* (Wall.)—*Wall.! L. n.* 6780.

II. XIMENIA. *Plum.; Linn.; Lam. ill. t.* 257.

Calyx small, 4- (or 5-?) cleft, persistent but not enlarging. Petals as many as the segments of the calyx, very hairy on the inside, connivent at the base, revolute above. Stamens twice as many as the petals, hypogynous, all fertile: filaments distinct or occasionally united by pairs: anthers distinct, adnate, linear, elongated. Ovary 4-celled, with 1 ovule in each cell. Style elongated. Fruit drupaceous, 1-seeded.—Trees or shrubs. Leaves ovate or lanceolate, quite entire.

318. (1) X. *americana* (Linn.:) shrubby: thorns axillary or terminating the branchlets, solitary, bearing occasionally leaves or flowers or sometimes smaller thorns: leaves oval, emarginate: peduncles 4–6-flowered: drupe oval; flesh thick; nut crustaceous.—*DC. prod.* 1. *p.* 253; *Spr. syst.* 2. *p.* 216; *Lam. ill. t.* 257. *f.* 1. and 2; *Roxb. fl. Ind.* 2. *p.* 252; *in E. I. C. mus. tab.* 209.—X. Russeliana, *Wall. L. n.* 6784.

†319. (2) X.? *olacioides* (W. & A.:) shrubby, unarmed?: leaves ovate, acuminated: fruits racemose, nearly globose: drupes dry, crustaceous, without any flesh, marked at the base with the remains of the 5 teeth or segments of the calyx: albumen amygdaloid: embryo cylindrical, slender, in the axis of the albumen and of nearly the same length: cotyledons semi-tercte, long, conferruminate: radicle short, obtuse, superior.—*Wight! cat. n.* 962.

As we have not seen the flower, we dare not make of this a distinct genus,

Digitized by Google

although the 5 calycine teeth (not 4, as in all the other species) and structure of the drupe evidently declare it to be so.

ORDER XXX.—AURANTIACEÆ. *Corr.*

Calyx urceolate or campanulate, short, 3–5 toothed, withering. Petals 3–5, broad at the base, inserted on the outside of an hypogynous disk: æstivation slightly imbricative. Stamens equal in number to, or a multiple of, the petals, inserted upon the disk: filaments flattened below, and there distinct or monadelphous or polyadelphous: anthers versatile, bursting inwards. Torus conspicuous, discoid. Ovarium plurilocular: style 1: stigma 1, somewhat lobed, thickish. Fruit (an *orange*) consisting of several (or 1, by abortion,) membranaceous carpels, with or without an internal pulp, and surrounded by a thickish indehiscent rind abounding in glands of volatile oil. Seeds attached to the inner angle of the carpels, solitary or numerous, usually pendulous: raphe and chalaza usually very conspicuous. Albumen none. Embryo straight: radicle next the hilum, partly concealed within the cotyledons: cotyledons large, thick, and amygdaline.—Trees or shrubs, every part abounding in glands full of volatile oil. Leaves alternate, usually compound; leaflets jointed with the petiole, which is often dilated or winged: when apparently simple the leaves are also jointed, showing that they are even then pinnate leaves reduced to the terminal leaflet.

To enable the reader to seize more readily the characters we have given of the genera of this order, we subjoin an analysis of those having stamina twice as many as the petals, and a definite number of ovules in each cell of the ovary.

Ovules solitary, or 2-collateral in each cell. LIMONEÆ.
- Ovary cells as many as the petals:
  - Filaments combined. . . . . 1. *Atalantia.*
  - Filaments distinct.
    - Stamens 6; . . . . . 2. *Triphasia.*
    - Stamens 8–10.
      - Style elongated; (ovules 1–2 in each cell). . . 3. *Limonia.*
      - Style short, scarcely distinguishable: (ovules solitary). 4. *Glycosmis.*
- Ovary cells fewer than the petals:
  - Style short, scarcely distinguishable; ovules 1–2 pendulous from the apex of the cells. . . . . 5. *Sclerostylis.*
  - Style elongated; ovules solitary, peritropal, attached to the middle of the axis. . . . . 6. *Bergera.*

Ovules in pairs, one above the other. CLAUSENEÆ.
- Filaments distinct:
  - Ovary cells fewer than the petals. . . . . 7. *Murraya.*
  - Ovary cells as many as the petals;
    - Ovary hirsute; berry full of liquid; flower-buds angled. 8. *Cookia.*
    - Ovary glabrous; berry dryish; flower-buds not angled;
      - Stamens 8, dilated part of filaments concave; petals oval. . . . . 9. *Clausena.*
      - Stamens 10, filaments flat; petals linear-lanceolate. *Micromelum.*
- Filaments (8) combined to the middle: (anthers linear: ovarium 2–3-celled: style long: berry 2–3-celled with a resinous pulp: calyx tubular: petals 4.) . . *Luvunga.*

I. ATALANTIA. *Corr.*

Calyx 4–5-toothed. Petals 4–5. Stamens 8–10: filaments combined below into a tube, free and subulate at the apex; anthers cordate-ovate.

Digitized by Google

Ovarium globular, usually 4-celled: ovules 2 in each cell, collateral, and near the base of the cell. Style as long as the staminal tube. Stigma 3–4-lobed. Berry globose, 3–4-celled, 3–4-seeded.—Thorny shrubs, with simple leaves, flowers axillary and terminal.

320. (1) A. *monophylla* (DC.:) thorns small: leaves ovate or oblong, more or less emarginate at the apex: racemes short, sessile; pedicels long, slender: flower-buds oblong-pear-shaped.—*DC. prod.* 1. *p.* 535; *Wall.! L. n.* 6353.—Limonia monophylla, *Linn.; Willd. sp.* 2. *p.* 571; *Roxb. cor.* 1. *t.* 82; *fl. Ind.* 2. *p.* 378.—Turræa virens, *Kœn!; Hellen. act. Holm.* 1788. *t.* 10. *f.* 1 (not *Linn.*)—Trichilia spinosa, *Willd. sp.* 2. *p.* 554; *DC. prod.* 1. *p.* 623; *Spr. Syst.* 3. *p.* 69.—*Rheed. Mal.* 4. *t.* 12; *Burm. Zeyl. t.* 65. *f.* 1; *Rumph. Amb.* 2. *t.* 31?—*α*; raceme umbelliform, rachis almost wanting.—*Wight! cat. n.* 313. *a.*—*β*; raceme lax, with an evident rachis.—*Wight! cat. n.* 313. *b.*——Malabar and Coromandel.

Roxburgh's figure belongs to our *α*, but a raceme is introduced, perhaps by accident, corresponding to *β*. The figures in Rheede and Burmann are those of *α*.

321. (2) A. *racemosa* (W. & A.:) thorns large: leaves ovate or oblong, more or less emarginate: racemes longish, stalked: pedicels short: flower-buds globose.—*Wight! cat. n.* 314.——Southern provinces.

†322. (3) A. *capitellata* (Lindl.)—*Wall.! L. n.* 6355.

II. TRIPHASIA. *Lour.*

Flowers and carpels symmetrical, in a ternary proportion. Calyx 3-cleft. Petals 3. Stamens 6: filaments distinct, subulate, the lower part broad and flat: anthers cordate-oblong. Torus slightly elevated, forming a short stalk to the ovary. Ovary obovate, glabrous, 3-celled, with 1 pendulous ovule in each cell. Style longish, thick. Stigma obtuse. Fruit baccate, 1–3-celled. Seeds 1 in each cell, surrounded with mucilage: cotyledons lobed.—Thorny shrubs with simple or ternate leaves.

Occasionally flowers occur in which a third part is added, or even taken away, but the usual arrangement is the ternary. We feel almost inclined however to unite it with the Linnæan *Limonia*. We exclude *T. sarmentosa*, Bl., a plant, if the description be correct, more allied to *Sclerostylis*, if not a new genus. The only certain species of the genus is the following.

*323. (1) T. *trifoliata* (DC.:) leaves 3-foliate; leaflets ovate, retuse, crenated from about the middle and upwards, lateral ones the smaller.—*DC. prod.* 1. *p.* 536; *Spr. syst.* 2. *p.* 133; *Wight! cat. n.* 312.—T. aurantiola, *Lour.; Wall.! L. n.* 6381.—Limonia trifoliata, *Linn.!; Burm. Ind. t.* 35. *f.* 1; *Lam. ill. t.* 353. *f.* 2.—L. diacantha, *DC. l. c.*——In gardens only: probably introduced from China.

III. LIMONIA. *Linn.; Lam. ill. t.* 353.

Flowers and carpels symmetrical, in a quaternary or quinary proportion. Calyx 4–5-cleft. Petals 4–5. Stamens 8–10: filaments distinct, subulate, broadest and flat below. Anthers cordate-oblong. Torus elevated, forming a short stalk to the ovary. Ovarium obovate, 4–5-celled, glabrous, with 1–2 collateral pendulous ovules from the top of each cell. Style elongated. Stigma obtuse. Fruit baccate, 4–5- (or fewer by abortion) celled; seeds solitary in each cell, surrounded with mucilage.—Shrubs or trees. Leaves simple, 3-foliate, or pinnate.

Citrus angulata, Willd. (Rumph. Amb. 2. t. 32) belongs obviously to this genus.

Digitized by Google

§ 1. *Cells of ovary with one ovule.* L. veræ.

324. (1) L. *acidissima* (Linn.:) spines solitary: leaves pinnate, with 2–3-pair of leaflets and an odd one; leaflets oblong, retuse, crenated: petioles broadly winged: flowers corymbose; corymb umbelliform, peduncled, 2–3 together from the axils of the fallen leaves: pedicels equal to the peduncles: petals 4, oblong: stamens 8: fruit 1–4-celled, globose.—*DC. prod.* 1. *p.* 536; *Spr. syst.* 2. *p.* 314; *Lam. ill. t.* 353. *f.* 1; *Wight! cat. n.* 321.—L. crenulata, *Roxb. Cor.* 1. *t.* 86; *fl. Ind.* 2. *p.* 381; *DC. prod. l. c; spr. syst. l. c; Wall.! L. n.* 6364.—*Rheed. Mal.* 4. *t.* 14.

§ 2. *Cells of ovary with two collateral pendulous ovules.* L. spuriæ.

325. (2) L. *alata* (Herb. Madr.:) unarmed?: leaves 3-foliolate leaflets cuneate-obovate, quite entire: petioles slightly winged: flowers in small panicles; ultimate pedicels short: petals 5, broadly oval: stamens 10: fruit globose.—*Wall.! L. n.* 6363; *Wight! cat. n.* 324.——Foot of the Neelgherries. Common in Ceylon.

326. (3) L. *Missionis* (Wall.:) spines solitary, or in pairs: leaves simple, elliptic-oblong, shortly petioled: racemes in the axils of the spines, many-flowered, somewhat capitate, much shorter than the leaves: fruit 4–5-celled. —*Wall.! L. n.* 6358; *Wight! in Hook. bot. misc.* 3. *p.* 291. *suppl. t.* 33; *cat. n.* 324.——Tanjore.

IV. GLYCOSMIS. *Corr.*

Flowers and carpels symmetrical, in a quinary or quaternary proportion. Calyx 4–5-cleft. Petals 4–5. Stamens 8–10, alternate ones shorter: filaments distinct, broader and flat below, tapering upwards: anthers cordate-oblong. Torus discoid and glandular, more or less elevated in the centre and forming a stalk to the ovary. Ovarium ovate, 4–5-celled, with 1 ovule pendulous from the apex of each cell. Style conical, very short and thick, scarcely distinguishable from the apex of the ovary. Stigma somewhat lobed. Fruit globose, baccate, by abortion 1–2-celled, with 1 seed in each cell.—Thornless shrubs or trees. Leaves pinnate, leaflets alternate.

In the true species, the seeds are surrounded by little or no mucilage. This genus is principally to be distinguished from our first section of the last by its style; by which character *Limonia citrifolia* Roxb. approaches to it, but having simple leaves, and 2 ovules in each cell, may form the type of a new genus. Roxburgh's *L. pentagyna* (fl. Ind. 2. p. 382), an arborescent plant with pinnate leaves, from the Circars and Bengal, may probably belong to this genus: but if, as the name imports, it has 5 styles, it cannot belong to the present nat. order. *Cookia cyanocarpa* and *chlorosperma* of Blume, appear to be species of *Glycosmis*.

§ 1. *Seeds dry, or surrounded by a little mucilage.* G. veræ.

327. (1) G. *arborea* (DC.:) a small tree: leaves pinnate; leaflets 3–7, alternate, oblong-lanceolate, toothed or serrated, or quite entire: panicles large: petals oval, glabrous: staminal filaments subulate: ovary and fruit glabrous.—*DC. prod.* 1. *p.* 538; *Spr. syst.* 2. *p.* 314; *Wall.! L. n.* 6373; *Wight! cat. n.* 318.—Limonia arborea, *Roxb.! cor.* 1. *t.* 85; *fl. Ind.* 2. *p.* 381. ——Circars.

The seeds are usually dry, but are occasionally accompanied with a small quantity of mucilage. We have not seen the blossom ourselves: Roxburgh represents the filaments subulate, but he says in his description that the whole parts of the flower are the same as in the next: if so, there is no good character to separate them. We cannot distinguish *G. macrophylla* β of Lindley in Wall.! L. n. 6377: we do not know his var. α.

Digitized by Google

328. (2) G. *pentaphylla* (DC.:) shrubby: leaves pinnate; leaflets 3–5, oblong or oblong-lanceolate, quite entire or toothed: panicles contracted: petals glabrous, broadly oval: filaments linear, broader upwards, suddenly contracted and subulate immediately below the anther: ovary glabrous.—*DC. prod.* 1. *p.* 538; *Spr. syst.* 2. *p.* 314; *Wall.! L. n.* 6374; *Wight! cat. n.* 317.—Limonia pentaphylla, *Retz?; Roxb. Cor.* 1. *t.* 84; *fl. Ind.* 2. *p.* 381.

We have not the mature fruit before us: Roxburgh says it is a pulpy berry, which seems to imply that it contains mucilage; but this we are inclined to doubt. All our specimens have the leaves much more narrow, and larger than in Roxburgh's figure.

329. (3) G. *nitida* (W. & A.:) shrubby: leaves pinnate; leaflets 3–6, alternate or usually nearly opposite, oblong or oblong-lanceolate, quite entire, coriaceous, shining above: racemes simple or compound, short: petals glabrous, frequently 4: filaments linear and flat to near the apex, acuminated below the anthers: ovary and fruit glabrous.—*Wight! cat. n.* 319.

Were it not that the parts of the flowers in our specimens were usually in a quaternary proportion, and the filaments different, we should have fixed on this as the species figured by Roxburgh as *Lim. pentaphylla:* the leaflets are generally of the same shape and size, but we have never found them more than three in a leaf. The seeds have no mucilage.

330. (4) G. *triphylla* (Wight:) shrubby: leaves pinnate; leaflets 2–3, rarely 4, elliptical, usually tapering suddenly at both ends but with an obtuse point, quite entire: racemes usually compound, somewhat capitate: petals oblong-lanceolate, glabrous: filaments subulate from the base: ovary on a longish stalk, and fruit glabrous.—*Wight! in Hook. bot. misc.* 3. *p.* 298. *suppl. t.* 39; *cat. n.* 320.——Tanjore.

331. (5) G. *angustifolia* (Lindl.:) shrubby: leaves pinnate; leaflets 2–5, alternate or opposite, narrow lanceolate, obtusely acuminated, shining above, quite entire: racemes short, compound: petals oval, glabrous: filaments subulate from the base: ovary and fruit glabrous.—*Lindl. in Wall.! L. n.* 6378; *Wight! cat. n.* 315.

§ 2. *Seeds surrounded by much mucilage.* G. spuriæ.

332. (6) G. *chylocarpa* (W. & A.:) shrubby: leaves pinnate; leaflets about 5, alternate, oblong, shortly tapering at both ends, shining above, quite entire: racemes compound, short: ovary distinctly stalked and fruit glabrous: berry 1-celled, 1-seeded; seed-coat membranaceous, glandular.—*Wight! cat. n.* 316.

Sent to Dr Wallich, but not noticed, that we can trace, in his List. This approaches very closely to Roxburgh's figure of *Lim. pentaphylla:* the leaflets are about the same size, and the fruit corresponds to his description, except being smaller, scarcely in the present species exceeding the size of a small pea.

V. SCLEROSTYLIS. *Blume.*

Flowers and carpels unsymmetrical. Calyx small, 4–5-cleft. Petals 4–5. Stamens 8–10, alternate ones shorter: filaments broader and flat below, tapering upwards: anthers cordate. Ovarium with 2–3 cells, (fewer than the petals): ovules 1, or 2 collateral, in each cell. Style very short and thick, scarcely distinguishable from the ovary. Stigma obtuse. Fruit globose, baccate, 1–2-celled, 1–2-seeded. Seed-coat membranaceous, veined.—Shrubs with simple or pinnate glabrous leaves.

Blume adds that the fruit is a dry berry, which part of the character we omit in order to include the species about to be described. *Amyris simplicifolia,* Roxb. fl. Ind. 2. p. 244, appears to belong to this genus.

333. (1) S. *atalantioides* (W. & A.:) armed with solitary strong spines:

Digitized by Google

leaves simple, short petioled, elliptic, emarginate, shining, crenulated: racemes small, few flowered, axillary and terminal: petals 5, oblong: stamens 10: ovary with 2, rarely 3, cells: ovules solitary; berries succulent, 2-celled. —L. bilocularis, *Roxb. fl. Ind.* 2. *p.* 377.—Atalantia? bilocularis, *Wall.! L. n.* 6356.——Coromandel; Dr Berry.

Resembling *Atalantia monophylla*, but smaller: no one appears to have found it but Dr Berry, who sent it in 1807 to the Bot. Garden at Calcutta.

VI. BERGERA. *Koen.*

Flowers and carpels unsymmetrical. Calyx 5-cleft. Petals 5, spreading. Stamens 10: filaments distinct, subulate, compressed below: anthers ovate. Ovarium oval, 2-celled, with 1 ovule in each cell, attached by its middle to the middle of the axis. Style elongated, thick. Fruit baccate, usually 1-celled and 1-seeded. Seed surrounded with mucilage: seed-coat membranaceous, glabrous: cotyledons glabrous, conspicuously auricled at their base: radicle villous.—Small tree with pinnate leaves.

We exclude *B. integerrima*, Ham.! (Roxb. in fl. Ind. 2. p. 376, and E. I. C. mus. tab. 1241), a plant with a thick clavate style, large obtuse stigma, 5-celled ovary, having 2 ovules, one above the other in each cell, and an usually 2-celled, 2-seeded berry, and belonging to *Micromelum* of Blume, if indeed it be not identical with his *M. pubescens*. We do not know *B. villosa*, Wall. L. n. 6372.

334. (1) B. *Koenigii* (Linn.:) leaflets alternate, ovate, acuminated, serrated, pubescent: panicles corymbiform, terminal.—*DC. prod.* 1. *p.* 537; *Roxb. Cor.* 2. *t.* 112; *Wall.! L. n.* 6370; *Wight! cat. n.* 327.—Murraya Koenigii, *Spr. syst.* 2. *p.* 315.

Rumph. Amb. 1. t. 53. f. 1, usually referred here, is an Araliaceous plant, (*Aralia umbraculifera*, Roxb.)

VII. MURRAYA. *Koen.; Linn.; Lam. ill. t.* 352.

Flowers and carpels unsymmetrical. Calyx 5-partite. Petals 5, connivent to the middle into a tube. Stamens 10: filaments distinct, linear-subulate: anthers ovate. Ovarium 2-celled: ovules 2, one above the other, in each cell. Style elongated. Fruit a fleshy berry, 2-, or by abortion, 1-celled; cells full of coloured fœtid liquid. Seeds solitary in each cell: seed-coat woolly.—Unarmed shrubs with pinnate leaves.

M. longifolia of Blume is distinguished by several characters from this genus.

335. (1) M. *exotica* (Linn.!:) leaflets 5–7, cuneate-obovate, obtuse or with a short blunt acumination, coriaceous: peduncles many-flowered, corymbose: berry globose, usually 1-seeded.—*DC. prod.* 1. *p.* 537; *Spr. syst.* 2. *p.* 315; *Lam. ill. t.* 352; *Roxb. fl. Ind.* 2. *p.* 374 (as to the spec. char. only); *Wall.! L. n.* 6368. *d, h*; *Wight! cat. n.* 326.—Chalcas Japonensis, *Lour. coch. p.* 332. —Marsana buxifolia, *Sonn. voy. Ind.* 3. *t.* 139.—*Rumph. Amb.* 5. *t.* 18. *f.* 2.

We are almost inclined to suspect that this only occurs cultivated in the Peninsula; at the same time we have specimens before us from Rottler's herbarium, which are probably the same as those of the Herb. Madr., said by Wallich to come from Courtallum. We have seen it also in Hamilton's herbarium from Patna in the western parts of Bengal.

336. (2) M. *paniculata* (Herb. Sm.!:) leaflets about 5, elliptical-ovate, shortly tapering with an emarginate point, acute at the base, shining, scarcely coriaceous, upper leaflets gradually but considerably larger than the lower: peduncles terminal, several-flowered, corymbose: berry oblong, with usually 2 seeds.—*Wight! cat. n.* 325.—M. exotica, *Roxb. fl. Ind.* 2. *p.* 374 (as to the wild plant, and description); *in E. I. C. mus. tab.* 48; *Wall. L. n.* 6368. *e.*— Chalcas paniculata, *Linn.; Lour. coch. p.* 331.——Not uncommon through-

Digitized by Google

out the Peninsula. We have also seen it from Goalpora in Hamilton's herbarium.

*337. (3) M. *Sumatrana* (Roxb.:) leaflets 5–7, ovate, acuminated, with an emarginate point, shining: peduncles solitary, 1-flowered, terminal, or in the axils of the upper leaves: berry oblong, usually 2-seeded.—*Roxb. fl. Ind.* 2. *p.* 375; *Wall. L. n.* 6369.—M. paniculata, *Jack. Mal. misc.* 1. *p.* 31; *in Hook. bot. misc.* 2. *p.* 79; *Hook. exot. fl. t.* 79.—*Rumph. Amb.* 5. *t.* 17 (descr. good; fig. bad as to the leaves).

We doubt extremely that this is a Peninsular species: we have inserted it because Wallich states his letter *a* to be from Heyne's herbarium, but it probably belongs to our last species: the only certain synonym in Wallich is *d*. The two species are certainly very closely allied, but the descriptions in Rumphius, Jack, Blume, and Roxburgh, of the plant from the islands, agree in the above characters.

VIII. COOKIA. *Sonn. voy.* 2. *t.* 131; *Lam. ill. t.* 354.

Flowers and carpels symmetrical. Calyx 4–5-cleft. Petals 4–5, oval, very concave and navicular or almost carinate: flower-buds carinately angled. Stamens 8–10: filaments distinct, subulate: anthers roundish. Ovary on a short stalk, covered with glands each bearing a tuft of hairs, 4–5-celled: ovules 2, one above the other, in each cell. Style short, thick. Stigma 4–5-toothed. Fruit globose, baccate, with a thin tough rind, 5-celled, or by abortion 1–2-celled: cells 1-seeded, filled with a balsamic liquid.—Small trees. Leaves pinnate: leaflets alternate or opposite, oblique at the base. Panicles terminal.

The above character is taken from *C. punctata* and *C. graveolens* (*Amyris graveolens*, herb. Ham.); *C. macrophylla*, Lindl. in Wall. L. n. 6367, and *C. falcata*, DC., are both too little known, and probably belong to quite distinct genera. *Amyris pentaphylla*, Roxb. (fl. Ind. 2. p. 247, and in E. I. C. mus. tab. 1551), evidently approaches very closely, but Roxburgh says that there are "many ovula in each" cell of the ovary: the flowers, as in *C. graveolens*, are in the quaternary proportion.

338. (1) C. *punctata* (Retz:) leaflets in three or four pairs, obliquely ovate-oblong, acuminated, quite entire, glabrous on both sides, scabrous on the nerves beneath: petals 5: stamens 10.—*DC. prod.* 1. *p.* 537; *Spr. syst.* 2. *p.* 314; *Roxb. fl. Ind.* 2. *p.* 382; *in E. I. C. mus. tab.* 943; *Wall.! L. n.* 6366; *Wight! cat. n.* 305, 365.—Quinaria Lansium, *Lour.*—*Rumph. Amb.* 1. *t.* 55.

Flower-buds at first very minute, as in Rumphius' figure, in which state the incipient ovary appears quite glabrous: they afterward increase, and the glands on the ovary become furnished with a tuft of hairs.

IX. CLAUSENA. *Burm.; Lam. ill. t.* 310.

Flowers and carpels symmetrical. Calyx 4-toothed. Petals 4, oval, concave, patent: flower-buds globose. Stamens 8, nearly equal: filaments distinct; below the middle connivent, dilated, and concave and slightly vaulted, receiving the angles of the ovary; subulate above: anthers ovate or oblong. Torus elevated in the middle into a stalk to the ovary. Ovary 4-celled, glabrous: ovules 2, one above the other, in each cell. Style cylindrical. Stigma obtuse, entire or 4-lobed. Berry dryish, 1-seeded. Seed-coat membranaceous.—Shrubs or trees with pinnated leaves, and terminal or axillary panicles or racemes.

The number of parts of the flower are occasionally increased by a fourth part. To this genus belongs several of Roxburgh's species of *Amyris* (fl. Ind. 2. p. 248–252), as *A. heptaphylla* (*A. anisata*, Roxb. in E. I. C. mus. tab. 1054), *A. nana* (E. I. C. mus. tab. 1406), *A. suffruticosa* (E. I. C. mus. tab. 1409), *A. Sumatrana* and *A. punc-*

Digitized by Google

tata (E. I. C. mus. tab. 937). Farther, his *A. acuminata* (E. I. C. mus. tab. 1831) appears to be a new genus next *Protium*; the *A. commiphora* (*A. agallocha* of the hort. Bengh.) a species of *Balsamodendron*; his *A. simplicifolia* and *A. pentaphylla*, we have already noticed, so that of the whole genus, not one belongs to *Amyris*, or even to the *Amyrideæ* as at present defined.

339. (1) C. *Willdenowii* (W. & A.:) shrubby: young branches, leaves, and racemes glabrous: leaflets 5–11, alternate, ovate or ovate-acuminated, slightly oblique at the base, more or less emarginate at the apex, crenulated; lower ones smaller, upper gradually larger and longer: panicles racemiform, axillary: stamens twice the length of the ovary, equal to the pistillum: stigma 4-lobed: fruit oblong.—*α*; leaflets oblong-ovate, much acuminated.—*Wight! cat. n.* 328. *a*, 329. *a.*—Amyris dentata, *Willd. sp.* 2. *p.* 337; *Spr. syst.* 2. *p.* 218.—Icica? dentata, *DC. prod.* 2. *p.* 78.—*β*; leaflets broadly ovate, scarcely acuminated.—*Wight! cat. n.* 329. *b.*—Bergera Koenigii, *Wall.! L. n.* 6370. *d* (partly),——Chingleput, near Madras.

Very nearly allied to *C. nana*, W. & A. (*Amyris nana*, Roxb.)

340. (2) C. *pubescens* (W. & A.:) shrubby: young branches, racemes and petioles densely pubescent: leaflets 7–11, alternate, ovate, acuminated, slightly oblique at the base, emarginate at the apex, crenulated, pubescent, particularly on the nerves; lower ones smallest: panicles racemiform, axillary: stamens twice as long as the ovary, equal to the pistillum: stigma 4-lobed.—*Wight! cat. n* 328. *b.*

Our specimen, although imperfect, can scarcely be united to the preceding species: in character it appears to approach more to *C. suffruticosa* (*Am. suffruticosa*, Roxb.), but that has a linear-oblong berry.

X. FERONIA. *Corr.*

Flowers often polygamous. Calyx flat, 5-toothed. Petals 5 (occasionally 4 or 6), patent. Stamens 10 (occasionally 11): filaments dilated and united at the base: anthers linear-oblong, tetragonal. Ovary seated on the elevated disk, 5- (occasionally 6-) celled: ovules numerous in each cell. Style scarcely any. Stigma oblong. Fruit baccate, with a hard rind, 5-celled, many-seeded. Seeds immersed in a fleshy pulp.—Trees. Leaves pinnated: leaflets 5–7, nearly quite sessile, obovate, very slightly crenulated, pellucid-dotted along the margin, inconspicuously so elsewhere; common petiole slightly winged. Racemes lax, few-flowered, terminal and axillary.

341. (1) F. *elephantum* (Corr.:)—*DC. prod.* 1. *p.* 538; *Spr. syst.* 2. *p.* 313; *Roth. nov. sp. p.* 383; *Roxb. Cor.* 2. *t.* 141; *fl. Ind.* 2. *p.* 411; *Wall.! L. n.* 6380; *Wight! cat. n.* 330.—Cratæva Vallanga, *Koen.*—*Rumph. Amb.* 2. *t.* 43.

XI. ÆGLE. *Corr.*

Flowers bisexual. Calyx 4–5-toothed. Petals 4–5, patent. Stamens 30–40; filaments distinct: anthers linear-oblong. Ovary 8–15-celled: ovules numerous in each cell. Style very short and thick. Stigma capitate. Fruit baccate, with a hard rind, 8–15-celled: cells 6–10-seeded. Seed-coat woolly, covered over with a slimy liquid.—Trees with simple spines. Leaves pinnate: leaflets 3, occasionally but very seldom 5, oblong or broad-lanceolate, crenulated, inconspicuously dotted, unequal, the terminal one the largest. Peduncles axillary, few-flowered: pedicels long. Flowers large.

342. (1) Æ. *Marmelos* (Corr.:) middle leaflet petiolate, lateral ones almost sessile: common petiole terete.—*DC. prod.* 1. *p.* 538; *Spr. syst.* 2. *p.* 598; *Roxb. Cor.* 2. *t.* 143; *fl. Ind.* 2. *p.* 579; *Wall.! L. n.* 6379; *Wight! cat. n.* 310.—Feronia pellucida, *Roth. nov. sp. p.* 384; *DC. prod.* 1. *p.* 538; *Spr.*

Digitized by Google

syst. 2. *p.* 314.—Cratæva Marmelos, *Linn.*—*Rheed. Mal.* 3. *t.* 37; *Rumph. Amb.* 1. *t.* 81; *Pluk. t.* 170. *f.* 5.——Malabar and Coromandel.

We doubt much if *Æ. sepiaria*, DC. and Blume, be really a distinct species.

XII. CITRUS. *Linn.; Lam. ill. t.* 639.

Flowers usually in a quinary proportion. Calyx urceolate, 3–5-cleft. Petals 5–8. Stamens 20–60: filaments compressed at the base, and there more or less united and polyadelphous: anthers oblong. Ovary many-celled: ovules 4–8 in each cell, one above the other in a double row, pendulous. Style terete. Stigma hemisphærical. Fruit baccate, 7–9-celled: cells with several seeds, filled with a fleshy substance composed of numerous irregular pulpy bags or vesicles, which are mere cellular extensions of the sides of the carpels.—Trees or shrubs with axillary solitary spines. Leaves reduced to one terminal leaflet jointed with the apex of the petiole: petiole often winged.

No two botanists are agreed as to what constitutes a species of this widely cultivated genus. Linnæus admitted only two; one, the citrons and lemons, with the petiole simple; the other, the orange and shaddock, with the petiole winged. Risso (Ann. de Mus. tom. v. 20) adopted characters also from the petiole, combined with the number of stamens, the shape of the fruit, and the taste of the pulp: he makes five species, omitting the shaddock; they are the citron, lime, lemon, orange, and bitter orange. De Candolle in his Prodromus follows him entirely. More lately Risso, along with Poiteau, has published a superb work on this genus, in which he adds the shaddock, the sweet lime, and sweet lemon, to his former list. These, however, he does not now call *species* but *types* or *races*, and he seems disposed to place little importance on the petiole, but he introduces instead characters from the colour of the flowers, and shape of vesicles of essential oil in the rind. Dr Buchanan Hamilton (Wern. Soc. Trans. vi. p. 316) feels inclined to unite all, except the shaddock or pompelmoes, into one species, adding, relatively to Risso's and De Candolle's five species, that such a "subdivision may be well suited to include the varieties commonly cultivated in Europe, but will be found inapplicable to those produced by long culture in Asia." At page 321, the same botanist concludes with, "On the whole, I am persuaded, that the five first species of *Citrus* enumerated by De Candolle, are only varieties of one tree: and I am doubtful if even the *C. decumana* can be properly considered as sufficiently distinct." After such authority, it would be perhaps presumptuous in us to express an opinion. We shall, however, retain the shaddock as distinct, and divide the others as suggested in Risso and Poiteau's work: if originally there have been well marked species, their distinctive characters have now been wholly obliterated by cultivation and cross grafting.

343. (1) C. *decumana* (Linn.:) young shoots pubescent: leaves (large) oval-oblong, acute or obtuse, coriaceous; petioles long and much winged: flowers (large, white): fruit (pale yellow); rind with flat or convex vesicles of oil; pulpy vesicles separate from each other.—*DC. prod.* 1. *p.* 539; *Spr. syst.* 3. *p.* 334; *Risso and Poit. hist. d'Or. t.* 61; *Wall. L. n.* 6388; *Wight! cat. n.* 306. *b.*—*Rumph. Amb.* 2. *t.* 24. *f.* 2.—*Pompelmoes* or *Shaddock.*

344. (2) C. *Aurantium* (Linn.:) young shoots glabrous: petioles more or less winged, or simple: fruit with the pulpy vesicles concrete.

1. C. *Aurantium* (Linn.:) leaves oval, elongated, acute, sometimes slightly toothed: petiole more or less dilated and winged: flowers white, large: fruit orange-coloured, roundish or ovoid, usually depressed, rarely terminated by a small knob; rind with convex vesicles of oil; pulp sweet.—*DC. prod.* 1. *p.* 539; *Spr. syst.* 3. *p.* 334; *Wall.! L. n.* 6390.—C. nobilis, *Lour.*—*Rumph. Amb.* 2. *t.* 34, 35.——*Sweet Orange.*

2. C. *vulgaris* (Risso:) leaves elliptical, acute or acuminated, slightly toothed: petiole more or less winged: flowers large, white: fruit orange-coloured, roundish or slightly elongated or depressed; rind

Digitized by Google

with concave vesicles of oil; pulp acid and bitter.—*DC. prod.* 1. *p.* 539; *Wall.! L. n.* 6384; *Wight! cat. n.* 306. *d.*—C. buxifolia, *Poir.*—*Rumph. Amb.* 2. *t.* 33.——*Bitter* or *Seville Orange.*

3. C. *Bergamia* (Risso:) leaves oblong, more or less elongated, acute or obtuse, under side somewhat pale: petiole more or less winged or margined: flowers usually small, white: fruit pale yellow, pyriform or depressed: rind with concave vesicles of oil: pulp more or less acid.—*Risso and Poit. l. c. t.* 53; *Wight! cat. n.* 322.—C. Limetta, var. *DC. prod.* 1. *p.* 539.—*Rumph.? Amb.* 2. *t.* 26. *f.* 1 (Limo unguentarius, *not* L. tuberosus); *t.* 26. *f.* 3 (L. taurinus, *not* L. unguentarius); *t.* 27; *t.* 28 (L. ventricosus, *not* L. ferus).——*Bergamotte* or *Acid Lime.*

4. C. *Limetta* (Riss.:) leaves oval or oblong, often toothed: petiole more or less winged or margined: flowers small, white: fruit pale yellow, ovoid or roundish, terminated by a knob: rind with concave vesicles of oil: pulp watery, sweetish, or insipid or slightly bitter.—*Sweet Lime.*—*α*; petioles nearly simple.—*Riss. and Poit. l. c. t.* 57.—C. Limetta, *DC. prod.* 1. *p.* 539; *Wall.! L. n.* 6385.—*β*; petioles broadly winged.—*Risso and Poit. l. c. t.* 59; *Wight! cat. n.* 306. *c.*—C. hystrix, *DC.! prod.* 1. *p.* 539.—C. Limonellus, *Wall.! L. n.* 6386?—*Rumph. Amb.* 2. *t.* 30.

5. C. *Lumia* (Risso:) leaves oval or oblong, usually toothed: petiole simply margined: flowers white tinged with red: fruit yellow, oval-oblong, terminated by a long knob: rind with convex vesicles of oil; pulp sweet.—*Risso and Poit. l. c. t.* 67, 68, 69.——*Sweet Lemon.*

6. C. *Limonum* (Risso:) young branches flexible: leaves oval or oblong, usually toothed: petiole simply margined: flowers white tinged with red: fruit yellow, ovoid or rarely globular, terminated by a more or less elongated knob; rind with convex vesicles of oil; pulp acid.—*DC. prod.* 1. *p.* 539; *Wall. L. n.* 6389; *Wight! cat. n.* 306. *a.*—*Rumph.? Amb.* 2. *t.* 26. *f.* 2 (Limo tuberosus, *not* L. ventricosus).——*Lemon.*

7. C. *medica* (Linn.:) young branches rigid: leaves oblong, pointed: petioles simple: flowers white tinged with red: fruit obovoid, deeply furrowed and wrinkled, terminated by a knob; pulp very slightly acid.—*DC. prod.* 1. *p.* 539; *Spr. syst.* 3. *p.* 334; *Wall. L. n.* 6387.—*Rumph.? Amb.* 2. *t.* 25, 29.——*Citron.*

ORDER XXXI.—HYPERICINEÆ. *Juss.*

Sepals 4–5, distinct or cohering, often unequal, persistent, dotted with glands: æstivation imbricative. Petals hypogynous, 4–5, often dotted with black glands; veins oblique: æstivation twisted. Stamens hypogynous, usually very numerous and polyadelphous; rarely as many or 2–4 times as many as the petals, and monadelphous or quite distinct: anthers versatile, dehiscing longitudinally. Ovary solitary: styles several, rarely connate: stigmas simple, sometimes capitate. Fruit baccate, or capsular with several valves and a septicidal dehiscence, usually several-celled with the placentæ in the axis, sometimes 1-celled with the placentæ nearly parietal. Seeds minute and indefinite, or 1–3 in each cell. Albumen none, or very rarely (in *Sarothra*) fleshy. Embryo straight: radicle next the hilum.—Herbaceous shrubby, or arbo-

Digitized by Google

rescent plants, variously and copiously dotted with glands, and having a resinous juice. Leaves usually opposite and entire, without stipules. Flowers generally yellow.

I. HYPERICUM. *Linn.; Lam. ill. t.* 643.

Sepals 5, more or less connected at the base. Petals 5. Stamens usually very numerous, united at the base into 3–5 bundles, rarely somewhat distinct. Styles 3–5, distinct or rarely combined, persistent. Capsule unilocular or with several cells. Membranaceous, 3–5 valved, many-seeded. Seeds roundish; seed-coat double: albumen none: embryo with semicylindrical cotyledons.—Herbaceous or shrubby plants. Leaves opposite, or very rarely (in *H. alternifolium*, Vahl, Wall. L. n. 4806) alternate, sessile or nearly so. Flowers either solitary, in threes, cymose, corymbosely panicled, or umbellate, usually yellow.

345. (1) H. *mysurense* (Herb. Madr.:) glabrous, shrubby: stem terete; young branches 4-angled: leaves opposite, crowded, oblong-lanceolate, tapering at both ends, acute, upper ones semi-amplexicaul, lateral nerves very slender, unbranched, springing from the midrib at a very acute angle, running almost straight and parallel to each other nearly to the apex of the leaf; pellucid dots roundish, oblong, and long-linear; black dots none: flowers (large) solitary at the extremities of 1-3 umbellately placed very short leafy branchlets: sepals ovate, unequal, entire, almost quite distinct, without black dots: petals not dotted: stamens numerous: styles 5, distinct, overtopping the stamens, longer than the ovary: stigmas slightly capitate: capsule 5-celled.—*Wall.! L. n.* 4808; *Wight! cat. n.* 331.——Mysore; *Heyne.* Neelgherries; *Notan.* Mountainous districts in the southern provinces.

346. (2) H. *Hookerianum* (W. & A.:) glabrous, shrubby, diffuse: stem terete; young branches compressed: leaves opposite, somewhat distant, oblong, obtuse with a mucro, contracted at the base with a kind of very short petiole; lateral nerves arching, and anastomosing; pellucid dots round and oblong; black dots none: flowers (large) solitary at the ends of the branches: sepals roundish-obovate, obtuse, entire, without black dots: petals not dotted: stamens very numerous: styles 5, distinct, overtopping the stamens, shorter than the ovary: stigmas obtuse: capsule 5-celled.—*Wight! cat. n.* 332. ——Southern Provinces.

347. (3) H. *Japonicum* (Thunb.:) perennial, herbaceous, glabrous, decumbent: stems 4-angled, slender: leaves opposite, sessile, oval, obtuse, 3-nerved at the base; pellucid dots roundish; black dots none: flowers (very small) in a leafy cyme with its branches elongated, simple or once or twice forked: pedicels slender in the forks of the inflorescence, and alternately in the axils of the leaves: sepals foliaceous, equal, oblong, entire, 3-nerved, without black dots; pellucid dots in the upper part roundish, in the lower half long-linear: petals free from dots, equal to the calyx: styles 3, clavate, spreading: capsule 3-celled.—*Thunb. fl. Jap. p.* 295. *t.* 31; *DC. prod.* 1. *p.* 549; *Spr. syst.* 3. *p.* 345; *Wall.! L. n.* 4811; *Wight! cat. n.* 333, 334, 335.

Closely allied to *H. humifusum* of Europe, having the same appearance and inflorescence, and occupying a very wide range in the East; specimens are before us from China and Nepal.

348. (4) H. *Wightianum* (Wall.:) herbaceous, glabrous, decumbent: stems terete, slender: leaves opposite, sessile, elliptical, crowded below, rather distant above, fringed at the base and the floral leaves along the margins with ciliary processes tipped with glands; pellucid dots roundish; black dots none: flowers (small) corymbose: sepals oblong-lanceolate, acute, equal,

Digitized by Google

toothed, fringed with bristles tipped with glands; pellucid dots linear below, roundish towards the point: petals twice as long as the calyx, with a few black dots along the margin: styles 3, distinct, somewhat clavate: capsule 3-celled.—*Wall.! L. n.* 4818; *Wight! cat. n.* 336.——Neelgherries.

A small species not unlike *H. Japonicum*. We should have considered it without hesitation as a state of *H. Nepalense*, Chois. in DC. prod. 1. p. 552 (*H. pallens* of Don), but Dr Wallich, who collected that plant in Nepal, and in whose List it seems to be named *H. setosum*, does not propose to unite them: we have not seen the Nepal plant.

ORDER XXXII.—GUTTIFERÆ. *Juss.*

Sepals 2–6, usually persistent, round, frequently unequal, and coloured: æstivation imbricated. Petals hypogynous, 4–10. Stamens hypogynous, indefinite, or rarely definite, distinct or variously united at the base: filaments unequal: anthers adnate, introrse, or extrorse; sometimes very small, sometimes unilocular, and sometimes opening by a pore. Torus fleshy, occasionally 5-lobed. Ovarium solitary, 1- or many-celled: ovules solitary, or several in each cell, erect or ascending; or numerous and attached to central placentæ: style usually none or very short, seldom conspicuous: stigmas peltate or radiate. Fruit capsular, or fleshy, or drupaceous, 1- or many-celled, 1- or many-seeded, valvular and septicidal, or indehiscent. Seeds definite, in a pulp, apterous, often arillate: testa thin and membranous. Albumen none. Embryo straight: radicle small next the hilum: cotyledons large, thick and fleshy, often cohering.—Trees or shrubs, sometimes parasitical: juice resinous. Leaves exstipulate, always opposite, coriaceous, with a strong midrib, and many oblique lateral parallel nerves. Flowers articulated with their peduncle.

I. GARCINIA. *Linn.; Lam. ill. t.* 405.

Flowers monœcious or diœcious. Sepals 4, persistent, without bracteoles. Petals 4, deciduous. MALE.—Stamens numerous, short, inserted on a large fleshy 4-angled or 4-lobed receptacle with or without an imperfect pistillum: anthers 2-celled, bursting longitudinally. FEM.—Stamens 8–30, (always?) imperfect: filaments distinct, or monadelphous, or 4-adelphous; the fascicles alternate with the petals, without intermediate fleshy glands: anthers destitute of pollen, and usually glandular. Ovary 4–10 celled: ovules solitary in each cell. Style very short, crowned with a large lobed peltate stigma. Fruit fleshy and juicy, indehiscent, 4–10 celled, crowned with the permanent style. Seeds solitary in each cell.—Trees.

Stalagmitis Cambogioides **is a species of this genus, and perhaps identical with *G. cochinchensis*, Chois.**

349. (1) G. *Cambogia* (Desr.:) leaves lanceolate: flowers terminal, nearly sessile, solitary: filaments of the female flowers about 16, distinct: stigma 8–10-lobed: fruit 8–10-sulcated, 8–10-seeded.—*DC. prod.* 1. *p.* 561; *Spr. syst.* 2. *p.* 448; *Roxb. Cor.* 3. *t.* 298; *fl. Ind.* 2. *p.* 621; *Wall. L. n.* 4856. —Cambogia Gutta, *Linn.*—Mangostana Cambogia, *Gærtn. fr. t.* 103.—*Rheed. Mal.* 1. *t.* 24.——Travancore.

Digitized by Google

We have not seen this species: our character is principally from Roxburgh's works.

* 350. (2) G. *Zeylanica* (Roxb.:) leaves lanceolate: flowers axillary and terminal; males about 3-together, on longish pedicels; females solitary, nearly sessile: filaments in the fem. distinct, as many as the cells of the ovary: ovary 6–8-sulcated: stigma 6–8-lobed, papillose with glands: fruit 6–8-sulcated.—*Roxb. fl. Ind.* 2. *p.* 621; *Wall. L. n.* 4867.——Introduced from Ceylon to the Missionaries Garden at Tranquebar; *Roxburgh.*

351. (3) G. *affinis* (W. & A.:) leaves lanceolate: flowers axillary and terminal; 1–3 together; male on longish, female on shortish peduncles: filaments in the fem. distinct, as many as the cells of the ovary: ovary deeply sulcated: stigma about 8-lobed, papillose with numerous glands.—*Wight! cat. n.* 341.—G. Gutta, *Wall.? L. n.* 4866.

Closely allied to *G. Zeylanica*, Roxb., but the female flowers are neither subsessile nor constantly solitary.

352. (4) G. *Cowa* (Roxb.:) leaves lanceolate: flowers terminal; male somewhat umbelled, on longish peduncles; female solitary, shortly peduncled: filaments of the fem. 4-adelphous, bundles 5–10-cleft: ovary globose: stigma 4–8-lobed, papillose with glands: fruit 4–8-sulcated, 4–8-seeded, globular-ovate.—*Roxb.! fl. Ind.* 2. *p.* 622; *DC. prod.* 1. *p.* 561; *Spr. syst.* 2. *p.* 448; *Wall.! L. n.* 4863. *a, c, d.*—Stalagmitis Cowa, *G. Don in Mill. dict.* 1. *p.* 621.—Oxycarpus Gangetica, *Ham.! in Wern. Soc. Trans.* 5. *p.* 344.

We have not seen Wall. L. n. 4863. *b.*, and so feel uncertain whether this be really a native of the Peninsula. Roxburgh describes *G. Cowa* with the female-flowers in umbels of 1, 3, or 5 flowers; but a specimen in Mr Arnott's herbarium, named by Roxburgh himself, has them solitary and nearly sessile, as described in De Candolle's prodromus. Perhaps *Oxycarpus Indica*, Pet. Th. (*Garcinia Indica*, DC.) is the same with this species, but the fruit is not described as furrowed. We do not place dependence on the colour of the juice that is procured by tapping the tree, as there is reason to suspect that this alters according to the season, or the age of the part that is pierced.

353. (5) G. *Kydia* (Roxb.:) leaves lanceolate: flowers terminal at the ends of the branches or of short axillary branches, or axillary; male about 3 together, on longish peduncles; female solitary, sessile: filaments of the fem. 4-adelphous, two opposite bundles 3–7-cleft, the other two bifid: ovary globose: stigma 4–8-lobed, papillose with glands: fruit 6–8-furrowed, 6–8-seeded, globose, the apex depressed with a knob in the centre.—*Roxb. fl. Ind.* 2. *p.* 623; *Wight! cat. n.* 339 *(male)*, 340 *(fem.)*.—G. lanceæfolia, *Wall.! L. n.* 4861 *c.* (not *Roxb.*)

The character from the fruit is taken from Roxburgh, who had his specimens from the Andaman islands; but the rest of our description agrees with his. It may, however, prove to be only a variety of *G. Cowa*, from which Roxburgh says it is "not to be distinguished except by the female inflorescence and shape of the fruit."

II. XANTHOCHYMUS. *Roxb.*

Flowers polygamous or bisexual. Sepals 4–5, persistent, without bracteoles. Petals 5, alternate with the sepals. Stamens (in both male and female flowers) 4–5-adelphous; bundles flat, elongated and divided at the apex into several short antheriferous portions, opposite to the petals, alternating with 5 large truncated glands: anthers 2-celled, bursting longitudinally. Ovarium (only in the bisexual flowers) 3–5-celled, with 1 ovule in each cell. Style scarcely any. Stigma 3–5-lobed. Fruit baccate, 3–5-celled. Seeds 1 in each cell, or fewer by abortion.—Trees.

Digitized by Google

354. (1) X. *pictorius* (Roxb.:) leaves linear-lanceolate, shining: flowers lateral, fascicled, all bisexual: anthers 5–9 to each bundle: ovary 5-celled: fruit ovate, pointed, 1–4 seeded.—*Roxb. Cor.* 2. *t.* 196; *fl. Ind.* 2. *p.* 633; *DC. prod.* 1. *p.* 562; *Spr. syst.* 2. *p.* 334; *Wall. L. n.* 4837; *Wight! cat. n.* 345.—Stalagmitis pictorius, *G. Don.*——Circars.

355. (2) X. *ovalifolius* (Roxb.:) leaves oval, shining: flowers lateral, fascicled, male and bisexual mixed: anthers about 6–8 to each bundle: ovary 3-celled: fruit oval, 1–3 seeded.—*Roxb. fl. Ind.* 2. *p.* 632; *Wall.! L. n.* 4838; *Wight! cat. n.* 346. *b.*—Stalagmitis ovalifolius, *G. Don.*—S. cambogioides, *Moon's cat. Ceyl. pl. p.* 73.—Cambogia Gutta, *Burm. fl. Ind.* (partly).—Arbor Indica Gummi Guttam fundens, *Burm. Zeyl. p.* 27.——Southern Provinces.

There can be now little doubt of this being the only plant in Ceylon that yields a gamboge fit for the arts, and that consequently the specific name of *Cambogia Gutta*, Linn., ought to have been applied to this species, and not to *Garcinia cambogia*.

356. (3) X. *spicatus* (W. & A.:) leaves oval, shining: male flowers in long axillary spiciform racemes; pedicels short: anthers numerous to each bundle of stamens.—*Wight! cat. n.* 346. *a.*

The leaves are precisely those of the last species. We have not seen the bisexual flowers, but the male have quite the structure of the genus.

III. MESUA. *Linn.*

Sepals 4, persistent, without bracteoles. Petals 4, alternate with the sepals. Stamens very numerous, slightly connected at the base into a fleshy ring: filaments filiform: anthers erect, 2-celled, bursting longitudinally. Ovary ovate, 2-celled: ovules 2 in each cell. Style longish: stigma peltate, entire. Capsule ovate, acute, 1-celled (by the obliteration of the dissepiment), 2-valved, 1–4-seeded. Cotyledons distinct.—A tree, with a straight slender trunk. Leaves oblong-lanceolate, acuminated, upper side shining, under glaucous: midrib and the margins coloured, lateral nerves close, parallel, almost inconspicuous. Flowers terminal or axillary, large, white. Fruit about the size of a small apple.

357. (1) M. *ferrea* (Linn.)—*DC. prod.* 1. *p.* 562; *Spr. syst.* 2. *p.* 126; *Roxb. fl. Ind.* 2. *p.* 605; *in E. I. C. mus. tab.* 1080; *Wall.! L. n.* 4834: *Wight! cat. n.* 343.—M. speciosa, *Chois. in DC. prod. l. c.*—Calophyllum Nagassarum, *Burm. Ind. p.* 21.—*Rumph. Amb.* 7. *t.* 2; *Rheed. Mal.* 3. *t.* 53 (bad).——Courtallum hills.

We do not think that the plant of Rheede is at all distinct: the figure and description are both bad and contradict each other. We agree with Dr Hamilton (Linn. Soc. Trans. 15. p. 129) that the Cingalese name ought to be written *Nag'-gaha* and not *Nā-gaha*, and that it has in Ceylon, as in all other parts of India, a reference to the divine serpent *Naga*: the name *ferrea* must have been given in allusion to *Yserhout*, the Dutch name of the plant, *nā* in Cinghalese meaning the *nose*.

IV. CALOPHYLLUM. *Linn.; Lam. ill. t.* 459.

Flowers often by abortion polygamous. Sepals 2–4, petaloid, deciduous. Petals 2–4, alternating with the sepals. Stamina usually numerous, or sometimes definite, more or less distinctly 4-adelphous at the base, or distinct: filaments short: anthers dehiscing longitudinally. Ovary ovate, 1-celled: ovule solitary, attached to the bottom of the cell. Style longish, flexuose. Stigma large, peltate, irregularly lobed. Fruit drupaceous, 1-celled, 1-seeded.

Digitized by Google

—Trees with leaves furnished with numerous transverse parallel slender nerves. Flowers disposed in axillary racemes or panicles.

358. (1) C. *Inophyllum* (Linn.:) branches terete: leaves elliptical or oboval, obtuse or retuse: racemes longer than the leaves, lax, from the axils of the upper leaves, or disposed in a terminal panicle: sepals and petals 4: drupe spherical (large).—*DC. prod.* 1. *p.* 562; *Spr. syst.* 2. *p.* 571; *Roxb. fl. Ind.* 2. *p.* 606; *in E. I. C. mus. tab.* 950; *Wall. L. n.* 4841; *Wight! cat. n.* 338.—C. Bintagor, *Roxb. l. c. p.* 607?—Balsamaria Inophyllum, *Lour.*—*Rheed. Mal.* 4. *t.* 38; *Rumph. Amb.* 2. *t.* 71; *Pluk. t.* 147. *f.* 3.

359. (2) C. *spurium* (Choisy:) young branches square: leaves cuneate-obovate, obtuse or emarginate: racemes lax, about as long as the leaves, axillary near the ends of the branches: sepals and petals 2: drupe oblong (small).—*DC. prod.* 1. *p.* 563; *Wight! cat. n.* 337.—C. Wightianum, *Wall.! L. n.* 4847.—C. Inophyllum, *Wall. L. n.* 4841. *g.*—C. calaboides, *G. Don in Mill. dict.* 1. *p.* 622.—C. apetalum, *Willd.; Spr. syst.* 2. *p.* 571.—C. calaba, *Linn.* (not *Jacq.*); *Burm. Ind. p.* 120.—*Rheed. Mal.* 4. *t.* 39; *Burm. Zeyl. t.* 60 (not good).——Travancore.

The specific name given by Willdenow is inadmissible, and that by Choisy scarcely more so. Roxburgh seems to have omitted it in his flora, although he sent specimens to Europe as *C. Calaba.*

† 360. (3) C. *longifolium* (Herb. Madr.)—*Wall. L. n.* 4851 (not? *Willd.*)

Dr Wallich remarks that it certainly does not belong to the genus.

ORDER XXXIII.—HIPPOCRATEACEÆ. *Juss.*

Sepals 5 (rarely 4 or 6), small, combined to their middle, persistent: æstivation imbricated. Petals hypogynous, alternating with and equal in number to the stamens: æstivation imbricated. Torus fleshy, cup-shaped, occupying the bottom of the calyx, expanding between the petals and the stamens. Stamens 3, distinct, arising from the apex or inside of the torus. Ovarium more or less hidden within the torus, but free from it, triangular, trilocular: ovules erect, 2 or more in each cell: style 1: stigmas 1–3. Placentæ in the axis. Fruit fleshy and 1–3-celled, or of 3 samaroid carpels. Seeds in each cell or carpel usually numerous, often solitary from abortion. Albumen none. Embryo straight: radicle next the hilum: cotyledons flat, elliptical, oblong, somewhat fleshy, cohering (at least in the dried plant).—Shrubs arborescent or climbing. Leaves opposite, simple, somewhat coriaceous. Flowers small.

From this order we exclude *Trigonia* and *Lacepedea*, these genera being only allied to it, and not legitimate members of it.

I. HIPPOCRATEA. *Linn.; Lam. ill. t.* 28.

Calyx 5-cleft. Petals 5, inserted between the torus and the calyx. Stamens 3, inserted on the top of the disk: filaments flat, much dilated at the base; anthers 1-celled, bursting transversely. Style shortish. Stigmas 3. Carpels 3, or from abortion only 1 or 2, compressed coriaceous, 1-celled, 2-valved, dehiscing at the narrow axis; valves navicular. Seeds oblong, compressed, winged downwards.—Trees or climbing shrubs with twisted branches. Flowers usually small and in dichotomous axillary panicles; branchlets and pedicels furnished with bracteas.

Digitized by Google

361. (1) H. *Indica* (Willd.:) glabrous: leaves elliptical, acute at the base, obtuse, acute or shortly acuminated at the apex, serrulated; young ones membranaceous, older ones firm: panicles dichotomous, corymbiform (short and broad), shorter than the leaves, axillary and terminal; terminal ones often thyrsoid by the abortion of the upper leaves: flowers very minute: petals linear-oblong: torus flattish, nearly discoid: ovules 2, collateral, in each cell: carpels oblong, striated (an inch long), each 2-seeded.—*DC. prod.* 1. *p.* 568; *Spr. syst.* 1. *p.* 178; *Roxb. Cor.* 2. *t.* 130; *fl. Ind.* 1. *p.* 165; *fl. Ind.* (*ed. Wall.*) 1. *p.* 169; *Wall.! L. n.* 4210; *Wight! cat. n.* 354, 355.—H. disperma, *Vahl, enum.* 2. *p.* 28.—H. obtusifolia, *Wall.! L. n.* 4211 (not *Roxb.*)——Pathucottah, Gingie hills, and elsewhere, not uncommon throughout the Peninsula. It is also found in Bengal.

De Candolle makes three varieties, but we have seen all the three on the same specimen.

362. (2) H. *obtusifolia* (Roxb.:) glabrous: leaves elliptical, obtuse or acute at the base, obtuse or shortly and obtusely acuminated at the apex, slightly serrated or almost quite entire, very coriaceous: panicles axillary and terminal, thyrsoid, longer than the leaves, terminal ones sometimes much elongated and compound from the abortion of the upper leaves: flowers pretty large: petals lanceolate, much longer than the calyx: ovules 6 in each cell: carpels obovate, emarginated, striated (1½–2 inches long), each 4–6-seeded. —*Roxb. fl. Ind.* 1. *p.* 166; *in E. I. C. mus. tab.* 2013; *fl. Ind.* (*ed. Wall.*) 1. *p.* 170; *DC. prod.* 1. *p.* 569; *Spr. syst.* 1. *p.* 178; *Wight! cat. n.* 352, 353.—H. tortuosa, *Wall.! L. n.* 4216.—H. volubilis, *Heyne* (not *Linn.*); *Wall. L. n.* 4215.—Salacia lævigata, *Wight!* (not *DC.*) *in Hook. Bot. Misc.* 3. *p.* 295. *suppl. t.* 36.——Madura and Tanjore districts.

Roxburgh's drawing at the India House enables us to ascertain that this is his plant. The flowers are large for the genus, being, when expanded, fully a quarter of an inch across; in *H. indica* they are not half a line. The petals (as well as the calyx and pedicels) are more or less minutely pubescent, but not ciliated as is stated in the specific character given by Dr Wight under *Salacia lævigata*. The *S. lævigata*, DC., has ciliated petals, and belongs to *Anthodon* of Ruiz and Pavon, a sub-genus of *Tonsella*, Schreb.

II. SALACIA. *Linn.; DC.*

Calyx 5-cleft. Petals 5, inserted between the torus and the calyx. Stamens 3, inserted on the top of the torus or between the torus and ovary: filaments flat, distinct: anthers adnate 2-celled; lobes divaricating at the base, dehiscing longitudinally. Ovary 3-celled: ovules 2 or more in each cell. Style short. Stigma obsoletely 3-lobed. Fruit indehiscent, fleshy, often 1-celled from abortion. Seeds solitary in each cell, wingless, covered with pulp.—Shrubs or small trees. Flowers in axillary corymbs, or more frequently, from the abortion of the common peduncle, on simple 1-flowered pedicels arising from a small axillary tubercle; rarely (ever?) in axillary dichotomous panicles.

All the species which we have examined have the ovules superposed, or one above the other, forming apparently a single longitudinal row; but in *Hippocratea*, we have found them collateral and evidently in a double series. If these remarks prove applicable to all the species of the respective genera, they would materially assist in their discrimination when only in flower.—As we consider the *S. chinensis* of Linnæus to belong to this, and not to *Salacia* as defined by St Hilaire, we retain the Linnæan name for the present genus (the *Calypso* of Pet. Thouars, and St Hilaire), from which *Johnia* of Roxburgh is no way distinct: *Salacia* of St Hilaire, with 1-celled, transversely dehiscing anthers, and fleshy fruit, is entirely a genus from the West Indies or South America, and the same with *Tonsella* of Schreber. The true *Salacia* is found only in Asia and Africa, with the exception of *S. campestris* (*Calypso campestris*, St Hil.); of this, however, we entertain doubts as to its being a legitimate species of the genus, but if it be so, it is the only one with elongated panicles of flowers.

Digitized by Google

363. (1) S. *prinoides* (DC.:) glabrous: branches terete: leaves oblong, obtusely acuminated, serrulated, coriaceous: pedicels several from an axillary tubercle, 1-flowered, about equal to the petioles: calyx-lobes round, much shorter than the petals, more or less puberulous and ciliated: petals broadly ovate, unguiculate, quite entire; torus large, cup-shaped, thick, fleshy, at first nearly enclosing the ovary: stamens short, about the length of the style, arising from the inner side of the torus: ovules 2, superposed, in each cell of the ovary: fruit nearly globose (about the size of a small cherry), 1-celled, 1-seeded.—*DC. prod.* 1. *p.* 571; *Wall.! L. n.* 4219; *Wight! cat. n.* 349, 350. —S. Wightiana, *Wall.! L. n.* 4221.—Tonsella prinoides, *Willd.! in Act. ac. nat. cur. Berol.* 4. *p.* 184; *Roem. and Sch. syst. veg.* 1. *p.* 547; *Spr. syst.* 1. *p.* 178.—Johnia Coromandelliana, *Roxb. fl. Ind.* 1. *p.* 169; *in E. I. C. mus. tab.* 534; *fl. Ind.* (*ed. Wall.*) 1. *p.* 173; *DC. prod.* 1. *p.* 571; *Spr. syst.* 1. *p.* 175.

We have before us specimens from Rottler's herbarium marked with the same vernacular Tamoul name (*Kadelanchi*) as those he sent to Willdenow; we do not understand, therefore, why Sprengel and also Mr G. Don (in Miller's Dictionary), attribute to the *Tonsella prinoides*, Willd., ciliated petals. We have not access at present to the original description, but neither De Candolle nor Roemer and Schultes, who quote from Willdenow, give such a description.

*364. (2) S. *Roxburghii* (Wall.:) glabrous: branches terete: leaves oblong-lanceolate, with a blunt acumination, nearly quite entire, coriaceous: pedicels several together from an axillary tubercle, 1-flowered, about equal to the petiole: calyx-lobes round: petals obovate-orbicular, quite entire, sessile: torus cup-shaped, thick and fleshy, at first nearly enclosing the ovary, obscurely 3-toothed at the apex: anthers almost quite sessile on the teeth of the torus: ovules 2, superposed, in each cell: fruit globose (about the size of a crab-apple), 2–3-seeded.—*Wall.! L. n.* 4217.—S. chinensis, *Linn.?; Jack.*—S. cochinchensis, *Lour.?*—Johnia salacioides, *Roxb. fl. Ind.* 1. *p.* 168; *in E. I. C. mus. tab.* 1520; *fl. Ind.* (*ed. Wall.*) 1. *p.* 172; *DC. prod.* 1. *p.* 571; *Spr. syst.* 1. *p.* 175.

We admit this, since Wallich quotes for it Heyne's herbarium, but Roxburgh states it to be a native of the eastern frontiers of Bengal. We have only seen Wallich's L. n. 4217. *c.*

365. (3) S. *Brunoniana* (W. & A.:) glabrous: branches terete: leaves oblong or elliptical, obtuse or with a short blunt acumination, slightly serrated, coriaceous: pedicels few (1–2) from an axillary tubercle, 1-flowered, about equal to the petiole: calyx with 5 short blunt teeth: petals ovate from a broad base, sessile, coriaceous, somewhat persistent with incurved margins (when dried), entire: torus cup-shaped, thick and fleshy, at first nearly enclosing the ovary: stamens short, from the inner side of torus: ovules 2, superposed, in each cell of the ovary.—*Wight! cat. n.* 347.—S. Roxburghii, *Wall.! L. n.* 4217. *e* (not Johnia salacioides, *Roxb.*)

The fruit we have not yet seen.

366. (4) S. *pomifera* (Wall.:) glabrous: branches terete: leaves elliptic-ovate, with a short blunt acumination, slightly serrulated, coriaceous: peduncles axillary, about as long as the petiole, forked; branches very short, bearing 2–3 flowers on very short umbellate pedicels: calyx-lobes round: petals round-ovate, sessile, quite entire: torus cup-shaped, thick and fleshy, at first nearly enclosing the ovary: stamens short, from the inner side of the torus: ovules 2, superposed, in each cell: fruit globose (as large as a wall-nut), 1-celled, 1-seeded.—*Wall. L. n.* 4227; *Wight! cat. n.* 348.

Although there be before us no specimen corresponding to that which Dr Wight formerly sent to Dr Wallich, we have little doubt as to the present being the species intended by him.

Digitized by Google

367. (5) S. *oblonga* (Wall.:) glabrous: branches terete: leaves elliptic-oblong, obtuse or with a very short blunt point, slightly serrated, thin-coriaceous: inflorescence about half as long as the petiole; peduncle axillary, short, about 3-flowered: pedicels about equal to the peduncle: calyx-lobes rounded: petals broadly elliptical, obtuse, sessile, very slightly ragged or toothed on the margin: torus discoid, slightly elevated in the middle round the base of the ovary: stamens longish, from the summit of the torus; filaments much dilated at the base: ovules 4, superposed, in each cell of the ovary.—*Wall. L. n.* 4226; *Wight! cat. n.* 351.—S. oppositifolia, *Rottl.* (from Trincomalee).

As Dr Wallich does not quote the name under which Dr Wight sent him this species, we do not feel quite certain that this is the plant intended. We have not seen the fruit. The petals seem to be erect, not patent as in most of the species: the stamens are as in *Hippocratea*, but the anthers are those of *Salacia*. The leaves have a yellowish tinge as in *Symplocos*.

†368. (6) S. *fruticosa* (Heyne.)—*Wall. L. n.* 4223.

ORDER XXXIV.—ERYTHROXYLEÆ. *Kunth.*

Sepals 5, combined at the base, persistent: æstivation imbricated. Petals 5, hypogynous, broad, and with a small scale at the base: æstivation slightly twisted. Stamens 10, hypogynous: filaments united at the base into a cup: anthers erect, bilocular, longitudinally and laterally dehiscing. Ovarium with 3 cells, of which 2 are sometimes rudimentary: ovule solitary in each perfect cell, pendulous: styles 3, distinct or united: stigmas 3. Drupe 1-seeded. Seed angular, pendulous. Embryo linear, straight, in the axis of a corneous albumen: radicle elongated, next the hilum: cotyledons linear, flat, foliaceous.—Trees or shrubs. Leaves alternate, rarely opposite.

We omit *Erythroxylon sideroxyloides*, Lam., which is stated in Roxburgh's Flora Indica (2. p. 449), to be a "native of Coromandel, Ceylon, &c." as by comparing the passage with the Hortus Benghalensis, and Wern. Soc. Trans. 6. p. 288, we believe that the whole was intended by Roxburgh to belong to his *E. monogynum*, and was only separated by an error of the press. We pass over also *E. longifolium*, Lam.; Wight! cat. n. 356 (*E. mauritianum*, Wall.! L. n. 6851), as the specimens are marked "from the Isle of France."

I. SETHIA. *Kunth.*

Calyx 5-lobed, or 5-parted. Styles 3, combined into 1: stigmas 3, distinct.

369. (1) S. *Indica* (DC.:) leaves alternate, obovate or oblong, obtuse, cuneate at the base, feather-nerved, reticulated with veins, under side pale: pedicels axillary, 1–3, about twice as long as the petiole, 1-flowered: calyx 5-lobed: styles combined nearly to the apex, longer than the stamens; stigmas clavate: drupes oblong, triangular, 3-celled; 2 of the cells small, abortive, and without seeds.—*DC. prod.* 1. *p.* 576; *Wall.! L. n.* 6848; *Wight! cat. n.* 357.—Erythroxylon monogynum, *Roxb. Cor.* 1. *t.* 88; *fl. Ind.* 2. *p.* 449; *Spr. syst.* 2. *p.* 391.—*Pluk. Amalth. p.* 87. *t.* 442. *f.* 3 (not *f.* 1–2); *Mant. p.* 26 *and* 167.——Circars, Mysore, Courtallum, and throughout the Carnatic.

ORDER XXXV.—MALPIGHIACEÆ. *Juss.*

Sepals 5, slightly combined, persistent: æstivation imbricated. Petals 5, hypogynous, unguiculate, occasionally wanting. Stamens 10 (rarely fewer), hypogynous: filaments distinct, or slightly monadelphous: anthers roundish. Torus usually discoid. Ovarium 1, usually

Digitized by Google

3-lobed, consisting of 3 carpels, more or less combined: ovules solitary: styles 3, distinct or united. Placentæ in the axis. Fruit dry or fleshy, of 3 distinct carpels or 3-celled, occasionally 1-2-celled by abortion. Seeds solitary, pendulous. Albumen 0. Embryo curved or straight: radicle short, next the hilum: cotyledons foliaceous or thickish.—Small trees or shrubs, sometimes climbing. Leaves simple, opposite, or very rarely alternate, not dotted, usually with stipules. Pedicels articulated in the middle.

We omit here *Ancistrocladus*, Wall., the *Wormia* of Vahl in Act. soc. hist. nat. Hafn. (Skrifter af Naturhistorie Selskabet) 6. p. 104, not of Rottboell, as we have not seen the Peninsular species, *A. Heyneanus*, Wall. L. n. 7262; nor do we yet possess sufficient specimens of the others to enable us to determine if it actually belongs to this order: the petals and stamens are perigynous, the former sessile: the base of the ovary is immersed in the bottom of the calyx, and is apparently 1-celled with 1 erect ovule, although there be three clavate angled and truncated styles: the fruit is inferior and crowned by the persistent enlarged lobes of the calyx, and is (according to Vahl) a 1-seeded drupe: Vahl says there are 5 stamens; we find 10, distinct, the alternate ones with extremely short filaments. To this genus the *Valli-modagam* of Rheede (Mal. 7. t. 47) seems to belong, and is probably the same with *A. Heyneanus*.

I. HIPTAGE. *Gærtn. fr. t.* 116.

Calyx 5-parted, furnished with 5 glands at the base on the outside. Petals 5, unequal, fringed. Stamens 10, one of them much longer than the others. Styles combined into one. Carpels dry, indehiscent, 3 (or usually only 1 or 2 from abortion), unequally 3-winged, with or without an additional central keel or small wing between the two lateral wings and parallel with them.—Climbing shrubs, with opposite leaves.

370. (1) H. *Madablota* (Gærtn.:) shoots shortish, branched: leaves (large) ovate or ovate-lanceolate, acuminated: fruit with the additional wing usually conspicuous.—*DC. prod.* 1. *p.* 583; *Spr. syst.* 2. *p.* 329; *Wall.! L. n.* 1063; *Wight! cat. n.* 362. *a.*—Molina racemosa, *Cav. diss.* 9. *t.* 263.—Gærtnera racemosa, *Roxb. Cor.* 1. *t.* 18; *fl. Ind.* 2. *p.* 368.—Banisteria Benghalensis, *Linn.*—B. unicapsularis, *Lam.*—Calophyllum Akara, *Herb. Burm.* (according to Choisy).—*Rheed. Mal.* 6. *t.* 59.

371. (2) H. *parvifolia* (W. & A.:) shoots elongated, twiggy: leaves (small) elliptical, obtuse or with a very short blunt point: fruit without the additional wing.—*Wight! cat. n.* 358 (from Ceylon), 362. *b.*—Gærtnera laurifolia, *Wall.? L. n.* 7265.——Courtallum.

This has quite a different appearance from the first species, but it is scarcely possible to assign sufficient characters.

II. PLATYNEMA. *W. & A.*

Calyx 5-partite, without glands at the base. Petals 5, about equal, flat, unguiculate, entire on the margin. Stamens 10, alternately shorter: filaments dilated at the base, flat, persistent: anthers linear-oblong, deciduous. Styles combined into one, filiform, longer than the stamens. Ovary with 3 short wings or keels at the apex, which probably in the fruit expand with long wings.—Leaves opposite, elliptical, obtuse.

* 372. (1) P. *laurifolium* (W. & A.)—*W. & A. in Jameson's Ed. N. Phil. Journ. July* 1833, *p.* 179; *Wight! cat. n.* 947.

Our specimens are from Ceylon, but it probably also occurs in the southern parts of the Peninsula. In the Philosophical Journal, we referred here the *Gærtnera laurifolia* of Wallich, but circumstances have now induced us to suspect that the plant he had in view was *Hiptage parvifolia*.

Digitized by Google

III. HIRÆA. *Schreb.; Kunth.*

Calyx of 5 sepals, with or without glands. Petals 5, roundish, unguiculate. Stamens 10: filaments awl-shaped, slightly connected at the base, alternately shorter. Styles 3, distinct. Carpels samaroid, 1-seeded, 3 (or rarely 2 from abortion), crested or naked on the back, surrounded by a membranaceous wing that is usually emarginate at both extremities.—Climbing shrubs. Leaves opposite. Flowers white, yellow, or reddish, panicled.

373. (1) H. *Indica* (Roxb.:) leaves broadly ovate, more or less acuminated, shining, glabrous on both sides: panicles axillary or terminal: calyx without glands: carpels each surrounded with an oblong-linear entire wing. *Roxb. hort. Bengh. p.* 90: *fl. Ind.* 2. *p.* 448; *DC. prod.* 1. *p.* 585; *Spr. syst.* 2. *p.* 389; *Wall.! L. n.* 1057; *Wight! cat. n.* 359.——Triopteris Indica, *Willd. sp.* 2. *p.* 744; *Roxb. Cor.* 2. *p.* 160.——Coromandel coast, and Circars.

* 374. (2) H. *nutans* (Roxb.:) leaves broadly ovate, acuminated, sometimes cordate at the base; upper side shining with a few adpressed hairs; under paler and hairy, the hairs fixed by their middle: panicles pendulous: calyx without glands: carpels surrounded with an elliptical ring.—*Roxb. hort. Bengh. p.* 90; *fl. Ind.* 2. *p.* 390; *DC. prod.* 1. *p.* 585; *Spr. syst.* 2. *p.* 389; *Wall. L. n.* 1056.

We introduce this on Dr Wallich's authority, who quotes Heyne's herbarium. We are not aware of its being found out of Bengal.

375. (3) H. *cordata* (Heyne:) leaves roundish, cordate, acuminated; upper side not shining, very slightly hairy; under, as well as the young branches, petioles, and panicles, tomentose: upper part of pedicels glabrous: calyx without glands.—*Wall. pl. As. rar.* 1. *p.* 13; *L. n.* 1060; *Wight! cat. n.* 359.

ORDER XXXVI.—SAPINDACEÆ. *Juss.*

Flowers polygamous. Sepals 4–5, distinct or slightly cohering at the base: æstivation imbricative. Petals usually as many as the sepals, alternating with them, sometimes fewer by the abortion of one, sometimes entirely wanting: inside either naked, or hairy, or glandular, or furnished with a petaloid scale: æstivation imbricative. Torus usually an hypogynous disk, occupying the bottom of the calyx, expanded between the petals and stamens; sometimes consisting of glands between the petals and stamens. Stamens 8–10, rarely fewer, very rarely 20, either inserted on the disk, or on the receptacle between the glands and the ovary: filaments distinct, or very slightly connected at the base: anthers bursting inwards longitudinally.—MALE. Pistil rudimentary or entirely wanting.—FEM. Ovary 3- (rarely 2- or 4-) celled: ovules usually solitary (and then generally erect or ascending), sometimes 2 (and then the upper one is ascending, the lower suspended,) or 3, rarely numerous in each cell: style undivided or 3-cleft, more rarely bifid. Fruit fleshy and indehiscent, or vesicular, or capsular and 2–3 valved; some of the cells are occasionally abortive. Seeds 1–3, or rarely numerous in each cell, usually arillate. Albumen none. Embryo rarely straight, usually curved or spirally convolute: radicle point-

Digitized by Google

ing towards the hilum: cotyledons sometimes conferruminate.—Leaves alternate, usually compound, having generally pellucid lines or dots.

TRIBE I.—SAPINDEÆ. *Camb.*

Ovary containing 1 ovule in each cell. Embryo curved, rarely straight.

I. CARDIOSPERMUM. *Linn.; Lam. ill. t.* 317; *Gærtn. fr. t.* 79.

Sepals 4, two outer ones smallest. Petals 4; the two lateral ones usually adhering to the sepals, each with an emarginate scale above the base; the two lower ones remote from the stamens, with their scales furnished with a glandular crest at their extremity, and ending in an inflexed appendage beneath the apex. Glands 2, round or linear, on the disk opposite the lower petals. Stamens 8, around the base of the ovary: the four that are nearest the glands are shorter than the others. Style 3-fid: segments covered on the inside with the adnate stigmas. Fruit a membranous bladdery capsule, 3-celled, 3-valved, loculicidal. Seeds globose, with a thick podosperm usually expanding into a 2-lobed aril.—Twining and climbing, usually tendrilled, herbaceous plants. Leaves biternate or supra-decompound, without stipules. Flowers racemose: common peduncles, with two opposite tendrils (abortive pedicels) under the racemes.

376. (1) C. *Halicacabum* (Linn.:) annual: stem, petioles, and leaves, nearly glabrous: leaves biternate: leaflets oblong, much acuminated, coarsely cut and serrated: glands of the disk roundish: fruit broadly pyriform.—*DC. prod.* 1. *p.* 601; *Spr. syst.* 2. *p.* 246; *Roxb. fl. Ind.* 2. *p.* 292; *Wight! cat. n.* 371, 372.—*Rheed. Mal.* 8. *t.* 28; *Rumph. Amb.* 6. *t.* 24. *f.* 2.

In Wight's cat. n. 371, the fruit is about the size of that in Rheede's figure; in n. 372, it is more than twice as large: but there appears to be no other difference. In both the capsules are pubescent.

377. (2) C. *canescens* (Wall.:) stem, petioles, and leaves, covered with a dense hoary pubescence: leaves biternate: leaflets ovate or obovate, acute, coarsely serrated: glands of the disk roundish: fruit nearly globose on a long-ish stalk.—*Wall. pl. As. rar.* 1. *p.* 14. *t.* 14; *Wight! cat. n.* 370.

The character taken by Dr Wallich from the leaflets being stalked or sessile, is very inconstant: the leaflets also vary from cuneate at the base to slightly cordate. The flowers are much larger than in the first species.

II. SCHMIDELIA. *Linn.; Lam. ill. t.* 312.—Ornitrophe. *Lam. ill. t.* 309.

Sepals 4, unequal. Petals 4, the fifth or superior one deficient and its seat vacant, either naked on the inside or usually furnished with a scale above the unguis. Disk incomplete, with 4 glands opposite the petals. Stamens 8, inserted on the receptacle, and connate round the ovary at its base. Ovary usually 2-, sometimes 3-lobed: style from between the lobes of the ovary, 2-3-cleft, the segments recurved, longitudinally stigmatose on the inside. Fruit indehiscent, 1-2-, or rarely 3-lobed: lobes somewhat globose, fleshy or dry, 1-celled. Seeds with or without an arillus.—Trees or shrubs, usually with trifoliate, rarely with simple, exstipulate leaves. Flowers white, small, in axillary racemes.

378. (1) S. *Cobbe* (DC.:) leaves trifoliate; leaflets stalked, ovate or oblong, acute, serrated; younger ones more or less pubescent above, villous beneath; older ones more glabrous, but always more or less pubescent: racemes axillary, solitary, simple, or sometimes bifid; rachis pubescent: petals cuneate, emarginate, with a scale bearing a tuft of hairs above the slightly hairy claw,

Digitized by Google

limb glabrous: stamens glabrous: ovary hairy, 2-lobed: style as long as the ovary, glabrous: fruit baccate.—*DC. prod.* 1. *p.* 610; *Spr. syst.* 2. *p.* 223 (excl. syn.); *Wight! cat. n.* 373 (partly), 375, 378 (partly).—Ornitrophe Cobbe, *Willd.*; *Roxb. fl. Ind.* 2. *p.* 268.—Rhus Cobbe, *Linn.*?—Toxicodendron Cobbe, *Gærtn. fr.* 1. *t.* 44.—*Rheed. Mal.* 5. *t.* 25 (not good).

There is no specimen of *Rhus Cobbe* in the Linnean herbarium, and what renders it more doubtful is that *Kobbæ* is applied in Ceylon both to this and to the next species: the present being the *Boo*-(or hairy)-*Kobbæ*, the other the *Moodu*-(or sea)-*Kobbæ*.

379. (2) S. *serrata* (DC.:) leaves trifoliate; leaflets stalked, ovate or oblong, acute or acuminated, serrated; younger ones glabrous, or pubescent particularly beneath and on the nerves; older ones glabrous, with a glandular tuft of hairs in the axils of the nerves: racemes axillary, solitary, simple; rachis pubescent: petals cuneate, emarginate, with a scale bearing a tuft of hairs above the slightly pilose unguis, limb glabrous: stamens glabrous: ovary hairy, 2-lobed: style as long as the ovary, glabrous: fruit baccate.—α; leaflets small, 2–3 inches long, pubescent beneath when young: racemes seldom so long as the leaves.—*Wight! cat. n.* 374, 376 (partly), 377, 380.—S. serrata, *DC. prod.* 1. *p.* 610; *Spr. syst.* 2. *p.* 222.—Ornitrophe serrata, *Roxb. Cor.* 1. *t.* 61; *fl. Ind.* 2. *p.* 266.—β; leaflets large, 3–6 inches long, glabrous when young, except in the axils of the nerves: racemes usually much longer than the leaves.—*Wight! cat. n.* 373 (partly), 376 (partly), 378 (partly), 379, 381.—Ornitrophe aporetica, *Roxb. fl. Ind.* 2. *p.* 264?

Roxburgh describes the style as very short, and the stamens very hairy at the base: the style appears to us only short when the ovary swells, and the base of the filaments is glabrous. We can perceive no essential difference between this and the former species. From the numerous specimens sent to Dr Wight by his collectors, it appears to be a most variable plant: and we fear much that *S. racemosa* may not be distinct; at least we cannot perceive the smallest difference between our var. α and the description of the Linnean specimen given by Smith in Rees' Cyclopœdia. Roxburgh's *Ornitrophe glabra* (fl. Ind. 2. p. 267, and in E. I. C. mus. tab. 1405), for which he quotes *S. racemosa*, being perfectly glabrous on the rachis of the racemes, as well as the leaves, may perhaps be distinct; but of this we have great doubts. Roxburgh's *O. aporetica* (perhaps however not the *Aporetica ternata* of Forster) is, according to the description, not different from our var. β. If the same botanist's description (fl. Ind. 2. p. 263) and figure (in E. I. C. mus. tab. 1406, under *All. ornitrophoides*) of *Allophyllus ternatus* (with which *Schmidelia distachya*, DC. is identical) be correct, it is quite distinct from *S. serrata*, and perhaps from the genus, as the petals are represented to be 4 and equidistant. As to *Allophyllus ternatus*, Lour., and *Gemella trifolia* of the same author, they appear quite the same plant, and we cannot point out how they are to be distinguished from *S. serrata*.

III. SAPINDUS. *Linn.*; *Lam. ill. t.* 307; *Gærtn. fr. t.* 70.

Calyx 4–5-partite. Petals as many as the sepals, rarely one of them abortive, naked or hairy or with a scale above the claw. Torus a disk occupying the bottom of the calyx, entire or crenulated. Stamens 8–10, inserted between the margin of the disk and the ovary. Ovary 3, rarely 2-celled: ovule 1, erect, at the base of each cell. Style crowned with a 3-, rarely 2-lobed stigma. Fruit externally fleshy, 1–2-lobed from abortion, rarely 3-lobed; lobes globular, indehiscent, 1-seeded. Seeds without an arillus. Embryo curved or straight.—Trees. Leaves without stipules, usually abruptly pinnate, sometimes unequally pinnate, or from abortion having only 1 leaflet. Flowers racemose. Berries saponaceous.

Digitized by Google

We have extended considerably the character given by Cambessedes, in order to include *S. laurifolius*, *S. fruticosus*, Roxb. (*Allophyllus pinnatus*, Roxb. in E. I. C. mus. tab. 1407, and perhaps *Sap. longifolius*, Vahl, not Roxb.), *S. rubiginosus*, and our *S. deficiens*, which, otherwise, would form the types of about as many genera. Probably *Erioglossum* of Blume might also be reduced, but from his saying that the fruit is edible, we suppose the seeds must have an arillus.

380. (1) S. *laurifolius* (Vahl:) petiole simple, terete: leaves abruptly pinnate: leaflets about 3 pair, ovate-lanceolate, quite entire, glabrous: racemes in terminal panicles: calyx 5-partite, segments oval: petals 5, lanceolate, equidistant, woolly all over the inside, without a gland or scale: stamens 8, woolly: ovary 3-lobed, very hairy: stigma 3-toothed: fruit of 3 combined globular berries: cotyledons unequal, spirally curved.—*Vahl, symb.* 3. *p.* 54; *DC. prod.* 1. *p.* 608; *Spr. syst.* 2. *p.* 250; *Roxb. fl. Ind.* 2. *p.* 278.—S. acutus, *Roxb. in E. I. C. mus. tab.* 1965.—S. trifoliata, *Linn.*—*Rheed. Mal.* 4. *t.* 19.
——Malabar.

We introduce this on the supposition that Vahl is correct in quoting Rheede's figure, and that Roxburgh is right in referring to Vahl: the plant which we describe we have only seen in Hamilton's herbarium, from the Calcutta garden, and is consequently the plant of Roxburgh. This author, however, although he says it is a native of various parts of India, does not, in the Flora Indica, cite Rheede, (although he does in the Hort. Bengh.), nor give any indication of the species being a native of the Peninsula. We do not unite here *S. Rarak*, DC., as Hamilton (Wern. Soc. Trans. 6. p. 331), wishes, as we rather consider that and Roxburgh's *S. longifolius* (not Vahl) to be the same.

381. (2) S. *emarginatus* (Vahl:) petiole simple, terete, pubescent: leaves abruptly pinnate: leaflets 2–3 pair, oblong, retuse or emarginate, quite entire, upper side glabrous, under very downy: racemes in terminal panicles: calyx-segments 5, oblong: petals 5, equidistant, oval; outside densely hairy; margin very woolly with a small woolly appendage on each side about the middle; inside nearly glabrous or with a few scattered hairs about the middle: stamens 8, woolly: ovary densely hairy: fruit 1–4-, but usually 3-lobed; lobes very hairy on the inside at the insertion of the seeds.—*Vahl, symb.* 3. *p.* 54; *DC. prod.* 1. *p.* 608; *Spr. syst.* 2. *p.* 251; *Wight! cat. n.* 385.

From this *S. detergens*, Roxb. (*S. abstergens*, Roxb. in E. I. C. mus. tab. 1235) is only distinguishable by the leaflets glabrous on both sides, and from 4 to 6 pair: Roxburgh says that it is common all over India, but we have not seen specimens from the Peninsula.

382. (3) S. *obovatus* (W. & A.:) petiole simple, terete: leaves abruptly pinnate: leaflets about 4 pair, narrow cuneate-obovate, rounded with a short sudden acumination, quite entire, glabrous on both sides: racemes terminal: calyx-segments 5, roundish: petals 5, equidistant, glabrous on both sides, with a roundish woolly glandular attached scale at the base on the inside: ovary densely hairy, oblong, triquetrous but not lobed, 3-celled.—*Wight! cat. n.* 386.

The fruit is unknown, and even the flowers in our specimen are imperfect.

383. (4) S.? *deficiens* (W. & A.:) petiole simple, terete: leaves abruptly pinnate: leaflets 6–7 pair, linear-oblong, lanceolate, acuminated, quite entire, glabrous: racemes solitary or in pairs, axillary: calyx unequal, 5-partite; segments rounded: petals 4 (the fifth deficient), oblong, attenuated into the unguis, woolly at the back on the lower half and margin, otherwise glabrous; scale glabrous, united to the petal at its woolly margins; the apex rounded, entire, free and inflexed: disk incomplete, unilateral: stamens 8, equidistant, woolly: ovary villous, ovate, with a short thick oblique point: stigma large, umbilicate, nearly entire, papillose above.—*Wight! cat. n.* 390.

There is one erect ovule at the base of each cell. We have not seen the fruit, but our only doubt as to the genus arises from the racemes being

Digitized by Google

axillary, not terminal as is usual in the genus: perhaps it may belong to *Cupania*.

384. (5) S. *rubiginosus* (Roxb.:) young branches, petioles, nerves of the leaflets and panicles, clothed with a dense rusty pubescence: leaves abruptly pinnate; petioles simple, terete; leaflets 4–6 pair, oblong-lanceolate, acuminated, quite entire, slightly hairy on the under side: racemes in terminal panicles: calyx unequal, 5-partite: petals 4 (the fifth deficient), glabrous, with a distinct unguis: limb cordate-oblong: scale attached to the petals by the margin, very woolly, with a woolly cristate appendage at its back (between the scale and the limb of the petal) below the apex and overtopping the scale: disk imperfect, unilateral: stamens 8, on one side, woolly: ovary excentric, very deeply 3-lobed, hairy: style longish: fruit of 1–2, rarely 3, oblong, nearly unconnected, berries.—*Roxb. Cor.* 1. *t.* 62; *fl. Ind.* 2. *p.* 282; *DC. prod.* 1. *p.* 608; *Spr. syst.* 2. *p.* 251; *Wight! cat. n.* 367.—*Jack in Mal. misc.* 1. *p.* 11; *in Hook. bot. misc.* 1. *p.* 280.—S. fraxinifolius, *DC. l. c.*—S. alternifolius *and* longifolius, *Herb. Ham.!*—Moulinsia rubiginosa, *G. Don.*—M. cupanioides, *Camb. in mem. mus.* 18. *p.* 40. *t.* 2.

One of Hamilton's specimens is from Gongachora, the other from Ranjamatty on the eastern frontiers of Bengal. Jack found it also at Pulo-pinang. Roxburgh is not correct as to the shape of the petals. The structure of the scale is obviously thus alluded to by Jack, "appendages furnished with two transverse lines of white hairs." Cambessedes' figure is good, but he incorrectly describes the fruit as a loculicidal capsule.

385. (6) S.? *microcarpus* (W. & A.:) petiole simple, terete, and the nerves of the leaflets beneath clothed with rusty pubescence: leaves unequally pinnate!: leaflets about 5 pair, nearly opposite, petioled, ovate-oblong, much and finely acuminated, quite entire; upper side glabrous and shining, under dull and reticulated with veins: panicles axillary, large, much branched, covered with a rusty pubescence: calyx 5-partite, segments (in fruit) unequal (small): drupes constantly solitary, with the mark of another (or two?) abortive at the base; epicarp thin fleshy; nut very hard and bony: style persistent, spinuliform, at the base of the drupe: embryo sharply bent at the junction of the cotyledons and radicle; cotyledons linear, curved round the acutely bent radicle.—*Wight! cat. n.* 554.

This has considerably the habit of a Terebinthaceous plant, particularly of Rumphius' small-fruited species of *Canarium*, but we have placed it in the present order from the structure of the fruit, which is obviously the result of a 2- or 3-celled ovary. The seed is solitary and erect: there is no albumen: the long radicle is bent up close on and applied to the back of the cotyledons, and then the whole embryo (cotyledons and radicle) is curved round the seed; so that the extremity of the radicle, of the cotyledons, and the point of junction of the cotyledons and radicle, are all close to each other, and point to the hilum. The fruit is about the size of a small pea. *Erioglossum* of Blume has also the leaves unequally pinnate; and *S. squamosus*, Roxb., has them so occasionally.

IV. CUPANIA. *Plum.*

Calyx 5-cleft or 5-parted. Petals 5, each usually furnished with a scale above the base, rarely 1 or all of them wanting. Torus a disk occupying the bottom of the calyx, entire or crenulated. Stamens 10, or fewer by abortion, inserted between the margin of the disk and the ovary. Ovarium 3-celled, with one erect ovule in each cell. Style simple or trifid. Capsule 2–3-angled, 2–3-celled, 2–3-valved, loculicide. Seeds erect, arillate.—Trees or shrubs. Leaves abruptly pinnated, or simple from abortion. Flowers whitish, in racemose panicles, or racemes.

Digitized by Google

Trigonia, *Molinæa* (Lam. ill. t. 305), *Guioa* (Cav. ic. 4. t. 373), *Dimeresa* (La Bill. nov. Cal. t. 51), *Diplopetalum*, *Gelonium* (Gærtn. fr. t. 139), *Tina*, *Ratonia*, *Mischocarpus*, *Blighia*, and *Stadmannia* (Lam. ill. t. 312), appear to be all referable to the present genus; nor is *Schleichera pentapetala* of Roxb. distinct.

386. (1) C. *canescens* (Pers.:) petioles simple, somewhat terete or angled: leaflets 2 pair, obovate or oblong, more or less obtuse or emarginate, quite entire, glabrous: racemes simple or panicled, from the old leafless shoots: calyx-segments rounded: petals 4 (the fifth deficient), flat, obovate-oblong, unguis silky at the back: scale woolly in front, bifid, waved or crisped on the margin, with a cuneate crested appendage at its back below the cleft: disk crenulated, complete but on the one (the upper) side of the ovary: stamens 8, unilateral (on the opposite side from the disk): ovary ovate: style simple, elongated: stigma 3-toothed: capsule ovoid, triquetrous.—*DC. prod.* 1. *p.* 613; *Spr. syst.* 2. *p.* 221; *Wight! cat. n.* 389.—Molinæa canescens, *Roxb.! Cor.* 1. *t.* 60; *fl. Ind.* 2. *p.* 243.—Sapindus tetraphyllus, *Vahl, symb.* 3. *p.* 54; *DC. prod.* 1. *p.* 608; *Spr. syst.* 2. *p.* 250.

We can see no traces of the fifth petal, described by both Vahl and Roxburgh. We have united this plant to Cupania for the same reasons we gave while extending the character of *Sapindus*.

V. NEPHELIUM. *Linn.*—Euphoria. *Lam. ill. t.* 306.—Scytalia. *Gærtn. fr. t.* 42.

Calyx 4–6-cleft or parted. Petals 4–6, glabrous or densely pilose or with a scale on the inside, sometimes wanting. Disk annular, occupying the bottom of the calyx. Stamens 6–10, inserted between the margin of the disk and the ovary. Ovary obcordate, usually didymous and 2-celled, sometimes 3-lobed and 3-celled; ovule one and erect in each cell. Style simple; stigma 2-lobed, or bifid, or 2–3 distinct. Fruit indehiscent, tubercled or muricated or smooth, usually 1-lobed from abortion. Seeds thick, covered by a fleshy arillus. Embryo straight.—Trees. Leaves exstipulate, abruptly pinnate, rarely simple. Flowers in racemose panicles, or racemes. Fruit eatable.

We can point out no character except the presence of an arillus to distinguish this genus from *Sapindus*. *N. Litchi*, *lappaceum*, and *rimosum*, W. & A. (*Scytalia rimosa*, Roxb.), have no petals.

387. (1) N. *Longanum* (Camb.:) leaflets 2–4 pair, of a firm texture, quite entire; upper side shining; under pale, somewhat glaucous, and apparently but not really pubescent, with strongly marked pinnate nerves: panicle lax, much branched, terminal: calyx deeply 5-partite: petals 5, narrow-oblong, spreading, hairy, without a scale: stamens 6–8, hairy: ovary 2–3-lobed: stigmas 2–3, linear: berries usually solitary or in pairs, very rarely 3 together, globose, with a slightly scabrous or nearly smooth pericarp.—Dimocarpus Longan, *Lour.*—Euphoria Longana, *Lam.; DC. prod.* 1. *p.* 611; *Spr. syst.* 2. *p.* 222.—*α*; leaflets oblong, obtuse.—*Wight! cat. n.* 364. *a.*—Scytalia Longan, *Roxb. fl. Ind.* 2. *p.* 270.—*β*; leaflets oblong-lanceolate.—*Wight! cat. n.* 364. *b.*—*γ*; leaflets narrow-oblong, acuminated, unequal at the base.—*Wight! cat. n.* 364. *c.*—Nephelium Benghalense, *G. Don in Mill. dict.* 1. *p.* 670.—Sapindus Benghalensis, *Roxb. in E. I. C. mus. tab.* 941.—Dimocarpus undulatus, *Wight mss.*

In all the states, even when the leaflets are very narrow and elongated, the extreme point is blunt. *Aporetica pinnata*, DC., appears very closely allied, nor can we make out, by the descriptions yet given, any character to separate it from the present species.

Digitized by Google

VI. SCHLEICHERA. *Willd.*

Calyx 5-toothed. Petals wanting. Disk occupying the bottom of the calyx. Stamens 6–10, inserted between the margin of the disk and the ovary. Ovary 3-celled, with one erect ovule from the base of each cell. Style crowned by a 3-cleft stigma. Fruit an indehiscent drupe, with 1–2 or rarely 3 cells. Seeds solitary in each cell, covered with a pulpy arillus. Embryo much curved.—Trees. Leaves exstipulate, abruptly pinnate: leaflets opposite or nearly so. Flowers small, disposed in spike-like racemes.

We have retained Willdenow's genus against Cambessedes' opinion, because the true species of *Melicocca* have a 4-partite calyx, 4 petals, 8 stamens, a 2-celled ovary, a 1-seeded drupe, a straight embryo as in *Nephelium*, and are natives of America; which combination of characters is surely sufficient. We shall give a specific character to the species we have before us, as there may be more than one in the East.

388. (1) S. *trijuga* (Willd.:) leaflets about 3 pair, oblong or broadly lanceolate, acute or obtuse or retuse, quite entire, nearly glabrous: racemes axillary or below the leaves, round the base of the young shoots, solitary, simple or compound: drupe globose, pointed, with a dry pericarp: seeds 1–2, rarely 3.—*Roxb.! fl. Ind.* 2. *p.* 377; *Roth. nov. sp. p.* 385; *Wight! cat. n.* 368, 382, 383, 384.—Melicocca trijuga, *Juss. in Mem. mus.* 3. *p.* 187. *t.* 8; *DC. prod.* 1. *p.* 615.—Stadmannia trijuga, *Spr. syst.* 2. *p.* 243.—Cussambium pubescens, *Ham. in Wern. trans.* 5. *p.* 357.—C. glabrum, *Ham.? c. l.*—Koon, *Gærtn. fr.* 2. *p.* 486. *t.* 180.

The Cingalese name is *Æmbul-kōn*. The shape of the leaflets varies on the same tree, and even sometimes on the same specimen. All our specimens have the fruit furnished more or less abundantly with stout prickles (as in Cussambium spinosum, *Ham.* and *Rumph. Amb.* 1. *t.* 57), which begin to make their appearance when the ovary is very little advanced: as this has not been noticed by Roxburgh, it may perhaps be caused by an insect. The petioles are usually pubescent, whence *Schleichera pubescens* of Roth may perhaps be a state of this plant with one of the terminal leaflets abortive, as in Rumph's figure of his *Cussambium*, which appears to us a very closely allied species if not a mere variety.

TRIBE II.—DODONÆACEÆ. *Camb.*

Ovary containing 2–3, rarely more, ovules in each cell. Embryo spirally twisted.

VII. DODONÆA. *Linn.; Lam. ill. t.* 304.

Calyx 4- or rarely 5-partite. Petals none. Disk hypogynous, usually inconspicuous. Stamens 8, rarely 9 or 10, inserted on the disk or receptacle. Style 2–3- rarely 4-cleft; the segments longitudinally stigmatose on the inside. Capsule 2–3–4-angled, with as many cells and valves, septicidal; valves carinate and winged on the back; central axis 2–4-angled, 2–4-winged. Seeds destitute of arillus.—Shrubs with exstipulate simple or pinnate leaves. Flowers small, greenish yellow.

389. (1) D. *Burmanniana* (DC.:) older branches terete, younger triquetrous: leaves simple, quite entire, oblong-lanceolate, cuneate and tapering at the base, obtuse or acute but not attenuated at the apex, clammy: flowers racemose: sepals ovate: capsules on longish pedicels, deeply emarginate at both ends; alæ 2–3, broad.—*DC. prod.* 1. *p.* 616; *Spr. syst.* 2. *p.* 242; *Wight! cat. n.* 366.—D. angustifolia, *Roxb. fl. Ind.* 2. *p.* 256 (not? *Willd.*); *in E. I. C. mus. tab.* 626.—Ptelea viscosa, *Burm. Ind. p.* 36.—*Burm. Zeyl. t.* 23; *Rumph. Amb.* 4. *t.* 50.

Digitized by Google

Rumph's figure obviously refers to this species, although the leaves are represented acuminated, but they are not said to be so in the description. We have the same species from Mauritius, and it seems to be very common all over the warmer parts of the East. We doubt if it, as well as *D. Jamaicensis, spathulata,* and *bialata,* be not all mere varieties of *D. viscosa,* Linn. The proportion of the fruit to the pedicel varies on the same specimen.

ORDER XXXVII.—MILLINGTONIACEÆ.

Sepals 5, persistent, unequal, somewhat in a double series: æstivation imbricative. Petals 5, inserted on the margin of the receptacle, deciduous, alternating with the sepals, of two kinds; three outer ones orbicular, entire, with an imbricative æstivation; two interior smaller, acutely bifid, resembling scales. Stamens 5, opposite to the petals, and slightly united to them at the very base: three exterior sterile, opposite to the larger petals; two interior fertile, opposite to the bifid petals: filaments of the fertile stamens flat: anther-cells globose, dehiscing transversely, placed side by side on the inner side of the saucer-shaped connectivum. Disk flat, thin, hypogynous, free except at its point of attachment with the ovary and receptacle. Ovary ovate, 2-celled; ovules 2 in each cell, superposed. Style simple, short, and thick. Stigma slightly 2-lobed. Fruit a 1-celled, 1-seeded drupe; the dissepiment evanescent above, hardened and persistent at the base. Seed with a small cavity on one side, near the base. Albumen none or extremely thin. Embryo curved: cotyledons thin, foliaceous, folded: radicle curved, pointing to the hilum.— Trees. Leaves alternate, without stipules, entire or rarely pinnated. Inflorescence in panicles, terminal, or axillary near the extremity of the branches. Flowers small, inconspicuous, nearly sessile on very short peduncles that are arranged along the horizontal branches of the panicles.

I. MILLINGTONIA. *Roxb.*

Character that of the order.

We have already noticed this genus at greater length in the Edin. New Phil. Journ. for July 1833, p. 178; at which time we had not seen the similar remarks made by Jack (Mal. misc. 2. p. 32). The following is the character according to those who look on the bifid petals and abortive stamens as nectaries: calyx of 3 leaves with 2 or more bracteoles. Petals 3. Nectaries 5, 2 of them thin, scale-like, bifid; 3 thick and fleshy. Stamens 2. Style 1. Fruit a 1-seeded drupe.

390. (1) M. *pungens* (Wall.!) leaves simple, coriaceous, lanceolate, acute at the base, quite entire, glabrous on both sides, nerves beneath with a rusty pubescence: panicle rigid, densely covered with a rusty pubescence; rachis terete; flowers on the ultimate branchlets of the panicle aggregated: calyx with 3 bracteoles; sepals unequal, glandularly ciliated: outer petals roundish, concave; inner ones cleft beyond the middle, equal to the filaments.— *W. & A.! in Ed. new ph. jour. l. c; Wight! cat. n.* 945.——Neelgherries.

391. (2) M. *simplicifolia* (Roxb.:) leaves simple, membranaceous, oblong-lanceolate, much attenuated at the base, quite entire, glabrous on both sides; lateral nerves incurved and confluent near the margin: panicle slender, lax, pubescent; rachis angled; flowers on the ultimate branchlets of the panicle somewhat distinct: calyx not bracteoled; three outer sepals the larger, cili-

Digitized by Google

ated: outer petals rounded, concave; inner cleft almost to the base, more than twice as short as the filaments.—*Roxb. fl. Ind.* 1. *p.* 103; *Cor.* 3. *t.* 254; *Spr. syst.* 1. *p.* 36; *W. & A. in Ed. new ph. jour. l. c*; *Wight! cat. n.* 946. ——Madura.

The description and figure given by Roxburgh are not correct as to the dissections, as we have ascertained by a specimen from Wallich in Dr Hooker's herbarium.

ORDER XXXVIII.—MELIACEÆ. *Juss.*

Sepals 3–5, distinct or more or less united: æstivation imbricative. Petals as many as the sepals and alternating with them, longer than the calyx, distinct, or rarely united at the base with each other or with the stamen-tube: æstivation valvular or imbricative. Stamens usually as many as the petals, rarely only as many, and very rarely numerous: filaments united into a firm tube: anthers introrse, sessile within the tube or on its margin, or adnate to the inside of the tube or its segments. Torus between the ovary and stamen-tube, either inconspicuous or discoid, or tubular. Ovarium single, cells usually equal to the number of petals, or fewer (2–3, or very rarely only 1), very rarely twice or four times as many: ovules usually in pairs, sometimes solitary, very rarely 4: styles and stigmas combined into one, very rarely distinct. Fruit baccate, drupaceous, or capsular, with several (or 1 by abortion) cells: dehiscence in the capsular fruits loculicidal. Seeds with or without an arillus, never winged or flat.—Tropical (or nearly so) trees or shrubs. Leaves without stipules, alternate or very rarely somewhat opposite, sometimes simple and quite entire, sometimes pinnated, or bipinnated. Flowers bisexual, but often by abortion having only one sex perfect.

The great characteristic of the Meliaceæ consists in the filaments combined into a tube, the position of the anthers, and the wingless seeds. *Aglaia* and *Milnea* have only 5 anthers, *Calpandria* a great many; *Aglaia* only 1 cell to the ovary; *Turræa* sometimes 10 or 20 cells. *Milnea? montana*, Jack, has the styles and stigmas distinct. With these exceptions, the order may be said to have a plurilocular ovary, the cells not exceeding the number of petals, a single style and stigma, and the anthers twice as many as the petals.

TRIBE I.—MELIEÆ. *Ad. de Juss.*

Embryo enclosed within a thin fleshy albumen: cotyledons foliaceous; radicle protruded.

I. NAREGAMIA. *W. & A.*

Calyx small, cup-shaped, 5-cleft. Petals 5, very long, strap-shaped, distinct, free from the stamen-tube. Filaments united into a long slender tube, that is inflated and globular at the apex, the mouth with 10 very slight crenatures, each bearing an anther: anthers spreading outwards, with a small appendage at the apex. Ovary broadly ovate, 3-celled: ovules 2 in each cell, collateral, pendulous. Style filiform, slender: stigma small, discoid-capitate, with 3 short points on the apex. Capsule slightly membranaceous, 3-cornered, 3-valved; valves orbicular. Seeds 2 in each cell, pendulous,

Digitized by Google

curved, slightly compressed, with a very short double membrane along the side next the axis: hilum slightly excavated.—Shrubby, glabrous. Leaves trifoliolate: leaflets cuneate-obovate, quite entire, sessile: petiole margined. Flowers large, on longish axillary solitary peduncles.

392. (1) N. *alata* (W. & A.)—*Wight! cat. n.* 391.—Turræa alata, *Wight, mss.*—Nela-Naregam, *Rheed. Mal.* 10. *t.* 22.

II. MELIA. *Linn.; Lam. ill. t.* 372.

Calyx 5-partite. Petals 5, patent. Stamen-tube 10-cleft at the apex, with 10 anthers in the throat; segments 2–3-partite; anthers opposite to the segments and a little shorter, oblong, slightly apiculate. Ovary seated on a short disk, 5-celled; cells each with 2 superposed ovules. Style columnar, breaking off from the top of the ovary: stigma 5-lobed. Fruit a drupe, with one 5-celled bony nut: cells 1-seeded.—Trees. Leaves alternate, bipinnate: leaflets in pairs with an odd one, toothed. Peduncles axillary, simple below, above panicled, branched, and many-flowered.

The number of parts of the flower is occasionally increased by a fifth.

393. (1) M. *Azedarach* (Linn.:) leaves deciduous; leaflets about 5 together, obliquely ovate-lanceolate, serrated, finely acuminated, glabrous: petals nearly glabrous.—*DC. prod.* 1. *p.* 621; *Spr. syst.* 3. *p.* 67; *Roxb.! fl. Ind.* 2. *p.* 395; *in E. I. C. mus. tab.* 643, 1968; *Wall.! L. n.* 1250; *Wight! cat. n.* 402.

394. (2) M. *sempervirens* (Sw.?) leaves evergreen; leaflets ovate, sometimes cordate at the base, cut or serrated, with taper entire apices, glabrous: petals nearly glabrous.—*Roxb.! fl. Ind.* 2. *p.* 305; *Wall.! L. n.* 1252.

This character, principally from Roxburgh, does not well accord with that of Swartz, although Roxburgh remarks that seeds from the West Indies produced plants quite the same as the East Indian plant. Roxburgh says that *M. sempervirens* "is perfectly distinct from Azedarak, which is a robust deciduous timber tree; and this a small delicate evergreen of short duration compared with the other:" but after examining all the specimens of both preserved in the collection presented by the East India Company to the Linnean Society, we can find no difference between them: indeed Roxburgh's own specimens look so much alike as to appear as if cut from the same tree.

395. (3) M. *composita* (Willd.!) young shoots, petioles, and panicles very mealy: leaves tri- or bi-pinnate; leaflets from 3 to 7 pair to each pinnule, ovate, acuminated, crenulated, glabrous: calyx and petals mealy.—*Willd. sp.* 3. *p.* 559; *Spr.? syst.* 3. *p.* 67; *Wight! cat. n.* 400.—M. superba, *Roxb. fl. Ind.* 2. *p.* 396; *Wall.! L. n.* 1254.—M. robusta, *Roxb. fl. Ind.* 2. *p.* 397; *in E. I. C. mus. tab.* 1969.——Malabar. Mysore.

We have the authority of Dr Wallich's specimen for considering this to be *M. superba* of Roxburgh, although Roxburgh says that the leaflets are cordate at the base; and it corresponds precisely with his description and figure of *M. robusta*, as well as with a specimen from the Calcutta garden in Hamilton's herbarium. We therefore do not hesitate to unite them, the more especially as both were found by Dr Berry in the forests of Malabar.

III. AZADIRACHTA. *Ad. de Juss.*

Calyx 5-partite. Petals 5, patent. Stamen-tube bearing 10 anthers in the throat, shortly 10-lobed; lobes reflexed: anthers opposite to the lobes, and about equal to them, oblong. Ovary seated on a short disk, 3-celled, ovules 2 in each cell, collateral, pendulous. Style columnar: stigma 3-partite, the

Digitized by Google

lobes conical. Fruit drupaceous, by abortion 1-celled and 1-seeded.—A tree with glabrous shoots. Leaves simply pinnated; leaflets unequal sided, glabrous, serrated. Panicles axillary.

The number of parts of the flower is occasionally decreased by a fifth.

396. (1) A. *Indica* (Ad. de Juss.)—*Ad. Juss. in mem. mus.* 19. *t.* 13; *Wight! cat. n.* 401.—Melia azadiracta, *Linn.; DC. prod.* 1. *p.* 622; *Spr. Syst.* 3. *p.* 67: *Roxb. fl. Ind.* 2. *p.* 394; *in E. I. C. mus. tab.* 94; *Roth. nov. sp. p.* 215; *Wall.! L. n.* 1251.—*Burm. Zeyl. t.* 15; *Rheed. Mal.* 4. *t.* 52.

IV. MALLEA. *Ad. de Juss.*

Calyx 5-toothed. Petals 5, patent. Stamen-tube deeply 10-cleft; each division acutely bifid and bearing an anther on the inside between the segments: anthers erect, cordate, slightly apiculate. Ovary 5-celled: ovules 2 in each cell, collateral, pendulous. Style short, clavate: stigma hemispherical, pointed with 5 small lobes. Fruit (a nuculanium) with a fleshy epicarp, containing 5 bony indehiscent 1-seeded nuts.—Shrubby. Leaves unequally pinnated; leaflets opposite, unequal sided, quite entire or serrated above the middle. Peduncles axillary, below simple, above with the flowers in a corymb or panicle.

397. (1) M. *Rothii* (Ad. de Juss.)—*Ad. de Juss. in mem. mus.* 19. *t.* 13; *Wight! cat. n.* 399.—Melia baccifera, *Roxb. in E. I. C. mus. t.* 95; *Roth. nov. sp. p.* 215; *DC. prod.* 1. *p.* 622.—Ekebergia Indica, *Roxb. fl. Ind.* 2. *p.* 392; *Wall.! L. n.* 1256.

We regret that M. de Jussieu has given the above specific name, as Roth certainly did not deserve the honour from the meagre description he has given of a plant that was already named to him: we regret also the generic name, as the vernacular name *Malle-notchi* given by Leschenault is probably from some mistake, the Telingee name being *Pooroodona*.

TRIBE II.—TRICHILIEÆ. *Ad. de Juss.*

Embryo without albumen; cotyledons thick: radicle short, commonly concealed within the cotyledons.—Leaves alternate, simply pinnated; leaflets quite entire.

V. MILNEA. *Roxb.*

Calyx 5-cleft. Petals 5, concave, erect. Stamens 5, closely combined into a globose slightly 5-toothed urceolus: anthers included. Ovary 2–3-celled: ovules 1–2 in each cell, peritropal, attached to the axis. Style 1, very short and thick (or 2?): stigma truncated and scarcely broader than the style (or 2?). Fruit a dry berry, usually by abortion 1-seeded. Seed covered with a complete fleshy arillus.—Trees or shrubs, the young parts with a scaly pubescence. Leaves unequally pinnated; leaflets almost opposite. Flowers in axillary panicles.

In the state of flower we can point out no certain character to distinguish this genus from *Aglaia*, for the number of cells and position of the ovules is, in our species, very difficult of determination. As the fruit advances, the dissepiment is more conspicuous, even when all the cells become abortive but one. We suspect that several of Blume's species of *Aglaia* belong to this. As to *M. montana*, Jack. (Lin. Trans. 14. p. 117), we should have looked on it as a species of *Aglaia* in the normal state, particularly as Loureiro appears to have seen *A. odorata* in China with two stigmas, and therefore probably with two cells to the ovary; and this is further confirmed by the circumstance that neither Jack nor Roxburgh have ever seen *A. odorata* attempt to produce fruit, the ovary being most likely deformed, in which state also are all the specimens we have ourselves seen from China. We should not therefore doubt that *M. montana* and *Aglaia odorata* are congeners, and perhaps even that *Milnea* might be united to *Aglaia*, but that Blume says that *Aglaia* has the seed without arillus, which *Milnea* and even *M. montana* certainly has.

Digitized by Google

398. (1) M. *Roxburghiana* (W. & A.:) leaflets about two pair with an odd one, elliptic-oblong, acute or slightly cuneate at the base, paler beneath: petioles terete: panicles longer than the leaves: petals elliptical; urceolus of stamens sessile: ovary 2-celled: berry ovoid, 1-seeded.—*Wight! cat. n.* 311.—Walsura? lanceolata, *Wall.! L. n.* 4886.——Southern provinces.

The arillus is complete as in the genus.

VI. AMOORA. *Roxb.*—Aphanamixis. *Blume.*

Polygamous. Calyx 3-leaved, with 2 or more subtending bracteoles in the female, usually without them in the male. Petals 3, broad, concave, patulous. Stamen-tube between globose and campanulate, obtusely 6-lobed at the apex, bearing 6 anthers on the inside about the middle: anthers included, opposite to the lobes, oblong, trigonal, attached by the back. Ovary depressed, 3-celled; ovules 2 in each cell, superposed. Stigma nearly sessile, pyramidal, 3-angled. Fruit a coriaceous capsule, 3-celled, 3-valved, loculicidal. Seeds solitary in each cell, attached by their middle, enclosed wholly or in part in a fleshy arillus. Cotyledons usually combined: radicle superior.—Trees. Leaves unequally pinnate, with many pairs of unequal sided leaflets. Inflorescence of male flowers panicled; of the fertile racemose or spicate.

Sphærosacme polystachya, Wall.! L. n. 1277 (*Aglaia polystachya*, Wall. in fl. Ind.) belongs to this genus. *S. laxa*, Wall.! L. n. 4894, is another species, and not distinct as we think from *Amoora cucullata*, Roxb. (*Buchanania paniculata*, Roxb. herb. and *Sph. polystachya*, Wall. L. n. 1277. *d.*) But the original *Sphærosacme* of Wallich (*Aglaia decandra*, Wall.! in fl. Ind.) has 10 stamens, and appears to us to be a species of *Lansium* of Jack and Blume, from which genus there is no character given to separate the New Holland *Nemedra elæagnoidea*, Juss., all having the same conformation of the stamen tube; but the fruit of *Nemedra* is unknown, and the female inflorescence is panicled.

399. (1) A. *Rohituka* (W. & A.:) leaflets opposite, about 6 pairs, obliquely oblong, glabrous, not prominently reticulated beneath: petioles when young with a few scattered short hairs on their lower part, soon quite glabrous: panicles of male flowers shorter than the leaves; fertile numerous, in solitary peduncled erect elongated spikes rather more than half the length of the leaves.—*Wight! cat. n.* 397, 398.—Andersonia Rohituka, *Roxb. fl. Ind.* 2. *p.* 213; *in E. I. C. mus. tab.* 934 *and* 1827.—Sphærosacme Rohituka, *Wall.! L. n.* 1278 (*male*).—S. spicata, *Wall.! L. n.* 4895 (*bisex.*)—Meliacea Wightiana, *Wall.!* (*in herb. Lin. Soc.*) *L. n.* 4888 (fruit).

Of Wallich's L. n. 1278, we have seen his *a* and *f*: both are male flowers, and from the locality, it is not improbable that all the letters except *f* belong to *A. cucullata*, Roxb. Cor. 3. t. 258, from which this species principally differs by the numerous spicate bisexual and female flowers, and leaves with usually more numerous leaflets. From *Aphanamixis Timorensis*, Ad. de Juss., it is still more difficult to distinguish it, unless that species have the veins of the leaves prominently reticulated beneath.

VII. SANDORICUM. *Cav.; Lam. ill. t.* 350.

Calyx shortly and obtusely 5-lobed. Petals 5, patent, distinct. Stamen-tube cylindrical, 10-toothed, bearing 10 anthers on the inside: anthers included, opposite to the teeth and applied to them, erect, cordate. Torus expanding upwards into a short membranaceous tube, sheathing the base of the style, torn and 5-toothed at the apex. Ovary half immersed in the bottom of the calyx: ovules 2 in each cell, closely collateral, pendulous. Style columnar. Stigma long, simple and globose at the base, above 5-lobed, with the lobes emarginate and slightly diverging. Fruit baccate, apple-like, 5-

Digitized by Google

celled, 1–2-cells being often abortive. Seeds solitary in each cell, arillate; arillus parchment-like, pulpy on the outside. Cotyledons very thick; radicle superior.—Trees. Leaves trifoliolate. Panicles axillary. Flowers crowded on the partial peduncles.

400. (1) S. *Indicum* (Cav.:)—*Cav. diss.* 7. *t.* 202, 203; *DC. prod.* 1. *p.* 621; *Spr. syst.* 3. *p.* 67; *Roxb. fl. Ind.* 2. *p.* 392; *Wall.! L. n.* 1249; *Wight! cat. n.* 404.—*Rumph. Amb.* 1. *t.* 64.—Trichilia nervosa, *Vahl; DC. prod.* 1. *p.* 623; *Spr. syst.* 3. *p.* 68.—T. venosa, *Spr. syst.* 3. *p.* 68.—Melia Koetjape, *Burm.*——Mysore.

VIII. WALSURA. *Roxb.*

Calyx short, 5-cleft. Petals 5, distinct. Stamen-tube deeply 10-cleft; divisions linear, bifid (or only alternately? bifid) at the apex, with an erect apiculate anther on the inside between each segment. Ovarium roundish, immersed in but not covered by the fleshy annular disk, 2- (or occasionally 3-) celled: ovules 2 in each cell, collateral, suspended from the axis near the apex. Style clavate, short; stigma spherical, with 2 (or occasionally 3) points or lobes at the apex. Fruit baccate, 1-celled. Seed solitary, with an arillus.—Trees. Leaves usually trifoliate, but occasionally with 2 or 4 leaflets. Panicles stalked, axillary or terminal.

We exclude from this genus *W. robusta*, Roxb., which perhaps does not belong to the order: in it the petals and stamens are decidedly perigynous; the filaments broad, quite distinct to the base, acute and entire at the apex, and bearing each an erect anther at its extremity; the style, stigma, ovary, and fruit, however, are quite those of a *Walsura*. *Trichilia? villosa*, Wall.! L. n. 1264, belongs undoubtedly to *Walsura;* and we think also *Xylocarpus Antila*, Ham. in Wall. L. n. 4893.

401. (1) W. *piscidia* (Roxb.:) leaflets oblong: panicles nearly quite glabrous; divisions of the stamen-tube all bifid.—*Roxb. fl. Ind.* 2. *p.* 388; *Wall.! L. n.* 1265; *Wight! cat. n.* 394, 395.—Heynea trifolia, *Ad. de Juss. in mem. mus.* 19.

†402. (2) W. *ternata* (Roxb.:) leaflets narrow-lanceolate: divisions of stamen-tube alternately bifid and rounded.—*Roxb. fl. Ind.* 2. *p.* 289.

With this we are not acquainted. Perhaps Roxburgh may have overlooked the segments of the shorter divisions of the stamen-tube, in which case it may not differ specifically from the first species.

IX. HEYNEA. *Roxb.*

Calyx short, 5-cleft. Petals 5, distinct. Stamen-tube deeply 10-cleft; divisions linear, forked at the apex; the segments with an erect, apiculate anther between them. Ovary immersed in the disk and covered by it, 2-celled: ovules 2 in each cell, collateral, pendulous from near the apex. Style short, clavate. Stigma spherical, tipped with 2 lobes or points. Fruit fleshy but capsular, 1-celled, 2-valved. Seed solitary, arillate. Cotyledons very thick: radicle superior.—Trees. Leaves pinnate: leaflets of several pairs. Panicles axillary, stalked.

Sometimes the flowers have a fifth part less. This genus and the last differ considerably in habit, but both present nearly the same characters except in the fruit, which here opens, there is indehiscent; in both it is fleshy. We ourselves have not seen the fruit of *Heynea*, but Roxburgh says it is a round fleshy capsule, 2-valved, "opening round the apex." *Guarea* is a somewhat allied genus, but does not occur in East India. *G. binectarifera*, Roxb.!, with which *G. Gotadhora*, Ham.! in Wern. Soc. Trans. 6. p. 307, and in Wall. L. n. 4884, seems identical, although without an arillus appears to be a species of *Epicharis* (*E. exarillata*, Arn.) *G. panicu-*

Digitized by Google

lata, Roxb. (Wall. L. n. 4882), we have not seen, the specimen sent along with that name by Dr Wallich to Dr Hooker, being by some accident a species of *Garcinia*; but from Roxburgh's description it must be a species of *Disoxylon*. *G. alliaria*, Ham.! l. c., although with an arillus, belongs apparently to *Hartighesia* (*H. alliaria*, Arn.); *G. Gobara*, Ham.! l. c. (Wall. L. n. 4885), seems to be also a species of that genus. Of *G. amaris*, Ham. l. c., the flowers are unknown; it has no arillus, and is probably a *Disoxylon*; and is we think the same as *D. multijugum*, Arn., or *Guarea paniculata*, Roxb.

403. (1) H. *affinis* (Juss.:) leaflets in 3 pairs, glabrous in the axils of the nerves, obliquely ovate, acuminated, extreme points bluntish: calyx segments with a callous tip: each forked segment of the stamen tube with a line of white hairs on the back running from the fork downwards.—*Ad. de Juss. in mem. mus.* 19; *Wight! cat. n.* 363.—H. trijuga, *Wall.! L. n.* 1258. *d, e,* (not *a–c.*)

X. XYLOCARPUS. *Koen.*

Calyx urceolate, 4-cleft. Petals 4, distinct, reflexed. Stamen-tube urceolate, 8-cleft at the apex, the segments acute, bipartite: anthers 8, included, erect, opposite to the segments. Ovary seated on a disk broader than itself and concave, 4-furrowed, 4-celled; cells 1–5-ovuled. Style short, with a broad concave discoid stigma. Fruit (large) spherical, 6–12-seeded: pericarp splitting into 4 valves opposite to the dissepiments; the dissepiments attenuated into membranes and nearly obliterated. Seeds inserted on the remains of the central axis, ascending, angled, with a spongy integument. Cotyledons very thick, combined: radicles short, dorsal.—Trees. Leaves abruptly pinnated. Panicles axillary or terminal. Flowers few, lax.

404. (1) X. *Granatum* (Koen.:) leaflets in 2 pairs, elliptical, obtuse, sometimes slightly acute at the base, glabrous.—*Roxb. fl. Ind.* 2. *p.* 240; *Wight! cat. n.* 964.—Carapa moluccensis, *Lam.*; *Rumph. Amb.* 3. *t.* 61?

We have only seen the unexpanded flowers. Ours, we believe, is certainly the plant of Koenig and Roxburgh, but we have some doubts about its being that of Lamarck, which is said to have ovate and acute leaflets. Dr Wallich has it not in his List, but a specimen from that botanist in Dr Hooker's herbarium marked, perhaps by mistake, *X. Granatum*, is *Amoora cucullata*, Roxb.

ORDER XXXIX.—CEDRELACEÆ. *R. Brown.*

Calyx of 4–5 sepals, or 4–5 cleft. Petals as many as, and alternate with, the segments of the calyx, distinct, sometimes unguiculate: æstivation twisted or convolutive. Stamens twice as many as the petals; those opposite to the petals shorter than the others, sometimes sterile or even deficient: filaments inserted on the hypogynous disk along with the petals; sometimes broad, flat, 2-toothed at the apex, and united by their margins into an 8–10-anthered tube; sometimes subulate, distinct, each 1-anthered at the apex: anthers fixed by the back at their base or at their middle, introrse or at length versatile, 2-celled, dehiscing longitudinally. Torus supporting the ovary, or placed round its base and cohering with it, or longer than the ovary and tubular and sheathing it. Ovary free, with as many cells as petals, rarely with fewer (3): ovules 4–8–12, or more, in each cell, in a double row: style simple: stigma

Digitized by Google

sometimes as narrow as the style, usually broader and discoid, marked by 3–5 angles or lobes. Fruit woody, capsular, 3–5-celled, 3–5-valved; valves separating from the thick axis, which is 3–5-angled or winged by the dissepiments that are opposite to the margins of the valves. Seeds in a double row close to the inner angle of the cells, without an arillus, flat, and winged, imbricated. Albumen thin and fleshy, or none. Radicle very small: cotyledons thin, foliaceous, large.—Trees. Leaves alternate, exstipulate, pinnated. Flowers panicled, bisexual, or usually unisexual from the abortion of the anthers or ovary.

TRIBE I.—SWIETENIEÆ. *Juss.*

Corolla twisted in æstivation. Filaments united into a tube. Hilum usually situated at a distance from the embryo and at the apex of the wing which is then traversed by the raphe; rarely close to the embryo, the wing expanding in an opposite direction.

I. SOYMIDA. *Ad. de Juss.*

Sepals 5, imbricated. Petals 5, patent, shortly unguiculate. Stamen-tube cup-shaped, thickened upwards into 10 lobes, which cohere together by their base, but are free and 2-toothed at the apex, with an anther between the teeth: anthers nearly included, obovate, attached by their back at the apex. Ovarium seated on the disk, which is broader than itself and covers the bottom of the tube, 5-celled: ovules 12 in each cell. Style short, equal, 5-angled: stigma thick, peltate, 5-angled. Fruit capsular, oblong-obovate, 5-celled, 5-valved, dehiscing from the apex, septifragal: the thin woody sarcocarp in each valve becoming detached from the endocarp, and both from the large persistent axis that is 5-angled by the dissepiments. Seeds pendulous from the top of the axis, imbricated in each cell, flat, expanding on all sides, but particularly upwards (with the hilum at the extremity) and downwards, into a wing. Embryo nearly straight: cotyledons 2-auricled at the apex; radical conical, pointing upwards, concealed between the auricles of the cotyledons.—Leaves abruptly pinnate: leaflets opposite, 3–6-pair, oval-oblong, obtuse. Panicles large, terminal, or in the axils of the uppermost leaves.

405. (1) S. *febrifuga* (Juss.)—*Ad. de Juss. in mem. mus.* 19; *Wight! cat. n.* 403, 405.—Swietenia febrifuga, *Roxb. Cor.* 1. *t.* 17; *fl. Ind.* 2. *p.* 398; *DC. prod.* 1. *p.* 625; *Spr. syst.* 3. *p.* 69; *Wall.! L. n.* 1266.—S. rubra, *Rottl.! in Wall. L. n.* 4890.

II. CHICKRASSIA. *Ad. de Juss.*

Calyx short, 5-toothed. Petals 5, erect. Stamen-tube cylindric-oblong, 10-crenated, the crenatures each bearing 1 terminal anther: anthers ovate, exserted, erect. Ovary oblong, seated on a short disk of its own breadth, 3-celled: ovules numerous in each cell. Style short, thick, scarcely distinct in appearance from the ovary: stigma capitate, 3-lobed upwards. Fruit capsular, ovoid, 3-celled, 3-valved, dehiscing from the apex, septifragal: the woody sarcocarp separating from the endocarp, and both from the large persistent axis that is 3-winged by the dissepiments. Seeds numerous, imbricated in a double series horizontally across each cell, flat, expanding downwards (at the opposite extremity from the hilum) into a wing. Cotyledons orbicu-

Digitized by Google

lar, not auricled: radicle superior, cylindrical-oblong, oblique, exserted, applied to the edge of the cotyledons at their top.—Leaves abruptly pinnated, occasionally bipinnate in luxuriant plants: leaflets nearly opposite. Panicles terminal. Flowers pretty large.

Sometimes the number of parts of the flower is diminished by a fifth. Jussieu makes the generic name *Chukrassia*, on the supposition that the native name was correctly given in the Hort. Bengh. In the Flor. Ind., however, it is said to be *Chikrasses*, and we have therefore reverted as nearly as possible to that given by Roxburgh as a specific appellation.

406. (1) C. *tabularis* (Juss.:) leaflets 5–8-paired, obliquely ovate-oblong, unequal sided, obtusely acuminated, quite entire, more or less conspicuous, hairy in the axils of the nerves beneath: panicles terminal, erect.—*Ad. de Juss. in mem. mus.* 19; *Wight! cat. n.* 392.—Swietenia Chickrassa, *Roxb. fl. Ind.* 2. *p.* 399; *in E. I. C. mus. tab.* 1062.—Plagiotaxis Chickrassa, *Wall.! L. n.* 1269.—Cedrelæ species, *Wall.! L. n.* 4892.——Cunnawady-hills near Dindygul.

Dr Wallich enumerates two other species of his genus *Plagiotaxis:* of both of these we have examined the flowers: the one, *P. velutina*, Wall. L. n. 1270, is a true species of *Chickrassia;* the other, *P. grandiflora*, Wall. L. n. 1271, belongs to the *Meliaceæ* and to *Disoxylon* of Blume, as limited by M. Adr. de Jussieu; the petals are however often 6, and are united below with the stamen-tube.

TRIBE II.—CEDRELEÆ. *Ad. de Juss.*

Corolla with a convolutive or twisted-convolutive æstivation. Filaments distinct. Hilum situated at the extremity of the seed nearest the embryo.

III. CHLOROXYLON. *DC.*

Calyx short, 5-partite. Petals 5, shortly unguiculate, patent. Filaments 10, patent, awl-shaped, attenuated upwards, all bearing anthers: anthers versatile, cordate, apiculate, fixed by the middle of their back. Disk 10-sinuated; each sinus bearing a stamen, those alternating with the petals the larger. Ovary half immersed in the disk and adnate with it, 3-furrowed, 3-celled: ovules 8 in each cell, ascending. Fruit capsular, oblong, 3-celled, 3-valved, dehiscing from the apex, septifragal. Seeds about 4 in each cell, ascending, extending upwards (in an opposite direction from the hilum) into a wing.—Leaves abruptly pinnate: leaflets pale-coloured, small, numerous, alternate or nearly opposite, unequal sided, with minute pellucid dots. Panicle terminal, large, branched.

407. (1) C. *swietenia* (DC.:)—*DC. prod.* 1. *p.* 625; *Wall.! L. n.* 1268; *Wight! cat. n.* 406.—Swietenia chloroxylon, *Roxb. Cor.* 1. *t.* 64; *fl. Ind.* 2. *p.* 400; *Spr. syst.* 2. *p.* 69.

We have not had an opportunity of examining the ripe fruit.

IV. CEDRELA. *Linn.; Lam. ill. t.* 137; *Gærtn. fr.* 94.

Calyx short, 5-cleft. Petals 5, erect, furnished on the inside on the middle with a longitudinal plait or keel towards the base. Stamens and pistillum on a common stalk. Disk adnate with the stalk, glandular, 5-ribbed, concrete between the ribs with the interposed plaits of the petals, 5-lobed at the apex. Filaments 10, inserted on the summit of the disk; the 5 alternate with the petals subulate, bearing anthers; the other 5, opposite to the petals, very short, sterile, or usually wanting: anthers cordate, attached by their back a little above the base, at first introrse, at length versatile. Ovary on the top

Digitized by Google

of the stalk and disk, 5-celled: ovules 8–12 in each cell. Style short, 5-angled, deciduous: stigma peltate, obscurely 5-angled, marked above with 5 rays. Fruit capsular, 5-celled, 5-valved, dehiscing from the apex; valves separating from the persistent axis which is 5-angled by the dissepiments. Seeds suspended from the top of the axis, produced downwards into a wing. Albumen fleshy in small quantity, firmly adhering to the thin spongy integument of the seed. Embryo nearly erect: radicle superior, shorter than the cotyledons, exserted.—Leaves pinnated; leaflets opposite or nearly so, many-paired, unequal sided. Panicles terminal, large, pyramidal.

Occasionally the flowers exhibit the quaternary and senary arrangements.

408. (1) C. *Toona* (Roxb.:) leaves abruptly pinnate; leaflets from 6 to 12 pair, ovate-lanceolate, acuminated, slightly undulated on the margin, quite entire or slightly and distinctly toothed, glabrous: panicles drooping: petals ciliated: sterile filaments none: ovary with a very short stalk, and 8 ovules in each cell: capsule oblong.—*Roxb. Cor.* 3. *t.* 238; *fl. Ind.* 1. *p.* 635; (*ed. Wall.* 2. *p.* 423; *Roth. nov. sp. p.* 162; *DC. prod.* 1. *p.* 624; *Spr. syst.* 1. *p.* 795; *Wall.! L. n.* 1272; *Wight! cat. n.* 393.—*Rumph. Amb.* 3. *t.* 39.

A specimen sent from Java to Dr Hooker is named, and probably correctly, *C. febrifuga*, Blume: if so, we cannot see the slightest character to separate it from the present species. We suspect that there is some mistake about *C. villosa*, Roxb., mentioned in the Hort. Bengh., as Roxburgh omits it in the Flora Indica. The specimens from Nepal alone have the leaves toothed, but they do not appear to constitute a distinct species, even although the stamens be usually six; it was therefore called *C. hexandra* by Dr Wallich.

ORDER XL.—AMPELIDEÆ. *Rich.*

Calyx small, nearly entire. Petals 4–5, sometimes cohering above, and calyptriform: æstivation valvate. Stamens 4–5, opposite to the petals: filaments distinct, or slightly cohering at the base, or attached to the outside of a 5-lobed urceolus (formed of abortive stamens connected together by an expansion of the torus): anthers ovate, versatile. Torus an annular disk, bearing the petals on its exterior, and the stamens on its surface. Ovarium 2-celled with the ovules in pairs, or 6-celled with the ovules solitary: ovules erect: style 1, short: stigma simple. Berry globose, pulpy, 2- (or often by abortion 1-) celled. Seeds 1–6, erect: testa hard. Albumen horny. Embryo erect: radicle slender, inferior: cotyledons lanceolate or subulate.—Usually climbing shrubs. Leaves, lower ones opposite, upper alternate, with racemes opposite to them, which are sometimes abortive, and change into tendrils.

I. VITIS. *Linn.; R. Brown; Gærtn. fr. t.* 106.

Calyx nearly entire. Petals 4–5, distinct and patent, or united at the apex but distinct at the base, and falling off like a calyptra. Torus elevated in the centre, and surrounding the lower part of the ovary, with which it is incorporated, girt at the base by a short ring (expansion of the torus) upon which the stamens are inserted. Ovary partly enclosed within the torus, 2- (or occasionally 3-) celled. Ovules 2 in each cell. Berry 1–2- (or occasionally 3-) celled, 1–4-seeded.—Peduncles usually changed, occasionally in whole or in part, into tendrils.

Digitized by Google

§ 1. *Petals 4, usually distinct at the apex: stamens 4: style usually as long as the ovary: peduncles wholly either floriferous or changed into tendrils.* Cissus, *Linn.; Lam. ill. t.* 84.

\+ Leaves simple, entire, or lobed.

409. (1) V. *inæqualis* (Wall.) glabrous: stems slender, 4-angled: stipules ear-shaped: leaves ovate or oblong-lanceolate, acuminated, cordate or obliquely truncated at the base, entire, with close-pressed bristly serratures: umbels sessile: fruit obovate (size of a pepper-corn).—*Wall.! L. n.* 6010; *Wight! cat. n.* 419.—V. diversifolia, *Wall.! L. n.* 5996.—Cissus sicyoides, *Herb. Klein!*.—C. inæqualis, *Herb. Heyne!*.——Travancore.

410. (2) V. *quadrangularis* (Wall.:) glabrous: stems 4-angled, winged: stipules lunate, entire: leaves cordate-ovate, serrulated, short petioled: umbels shortly peduncled: petals distinct: fruit globose (size of a large pea), very acrid, 1-celled, 1-seeded.—*Wall.! L. n.* 5992; *Wight! cat. n.* 423.—Cissus quadrangularis, *Linn.!; DC. prod.* 1. *p.* 568; *Spr. syst.* 1. *p.* 448; *Roxb.! fl. Ind.* 1. *p.* 407; (*ed. Wall.*) 1. *p.* 426.—*Rheed. Mal.* 7. *t.* 41; *Rumph. Amb.* 5. *t.* 44. *f.* 2; *Pluk. t.* 310. *f.* 6.

V. glaberrima, Wall.! L. n. 5991, differs from this in the shape of the leaves. We allude to his specimens from "Singapore;" for as to some mixed with them from "Penang," they have the stem bluntly angled, and are more allied to *V. inæqualis*, although quite distinct also from it.

411. (3) V. *repanda* (W. & A.:) young parts tomentose: stems terete: stipules oblong: leaves cordate-roundish, shortly acuminated, entire, repand-toothed or serrated; young ones tomentose, particularly on the under side: tendrils none: umbels compound, peduncled: petals falling off cohering at the apex.—*Wight! cat. n.* 409, 413.—V. Wightiana, *Wall.! L. n.* 6003.—Cissus repanda, *Vahl, symb.* 3. *p.* 18; *DC. prod.* 1. *p.* 627; *Spr. syst.* 1. *p.* 448.—C. Indica, *Rottl.; Willd. in am. act. cur. Berol.* 4. *p.* 183; *DC. prod.* 1. *p.* 628.

412. (4) V. *Heyneana* (Wall.:) glabrous, pale green; young shoots slightly glaucous: stems terete: stipules adnate, cordate: leaves cordate, shortly acuminated, entire, with shallow, distant, incurved serratures; adult ones glabrous, firm, and coriaceous: tendrils stout, flexuose, simple: cymes compact, few-flowered, scarcely so long as the petiole: petals distinct: style slender: stigma slightly capitate: fruit obovate, 1–2-seeded.—*Wall.! L. n.* 5988, *a*, *b*; *Wight! L. n.* 978.——Travancore.

413. (5) V. *pallida* (W. &. A.:) nearly glabrous, or with young parts very slightly pubescent, pale green: young shoots scarcely glaucous: stems terete: stipules cordate: leaves broadly cordate, shortly acuminated, entire, with shallow distant glandular incurved serratures; adult ones glabrous: cymes on long peduncles, with 3–5 primary branches; ultimate branches umbellate, in fruit recurved: petals distinct: style slender: stigma slightly capitate: fruit about 1–2-seeded.—*Wight! cat. n.* 414.—V. Heyneana, *Wall.! L. n.* 5988, *c–f*.—Cissus vitiginea, *Roxb.* (not *Linn.*) *fl. Ind.* 1. *p.* 406; (*ed. Wall.*) 1. *p.* 424; *in E. I. C. mus. t.* 539.

Perhaps Dr Wallich was correct in uniting this with the last, but the inflorescence appears very different. Both, as well as that which follows, have the leaves of a pale or whitish green when dried, and were, perhaps, all united by Roxburgh under his *C. vitiginea*. Can this be a state of *V. Linnæi* growing in wet places?

414. (6) V. *repens* (W. & A.:) glabrous, pale green; young shoots glaucous: stem terete: stipules cordate, rounded: leaves cordate-ovate, acuminated, entire, with distant sharp spiniform teeth: umbels peduncled, rays again umbelliferous: petals distinct: style longer than the ovary: stigma capitate: fruit globose, about 1-seeded.—*Wight! cat. n.* 965.—V. glauca, *Wall.!*

Digitized by Google

L. n. 5990, *a–f.*—Cissus repens, *Lam.*; *DC. prod.* 1. *p.* 628; *Spr. syst.* 1. *p.* 447.—*Rheed. Mal.* 7. *t.* 48.

We consider the following to be Roxburgh's *C. glauca.* Roxburgh quotes under his *C. cordata* (*in E. I. C. mus. tab.* 1527.) the above synonym of Rheede, and that being the only authority for *Cissus repens*, Lam., Dr Wallich has called it *V. repens* (L. n. 5999, *a!*, with which his *V. glauca*, L. n. 5990, *g!* is identical): but *C. cordata*, Roxb., we have not seen from the Peninsula, and the figure of Rheede corresponds much better with what we call *V. repens.* As to *V. repens*, Wall. L. n. 5999. *b!* it belongs to *V. adnata*, and is precisely the same with his n. 5998. *d!* We may further remark, that *V. cordata*, Wall. L. n. 6008, is different from any of the above; and his *b* (with which n. 5998. *f.* (partly) is the same) is a distinct species from his *a*, and more allied to our *V. glauca.*

415. (7) V. *glauca* (W. & A.:) glabrous; young shoots very glaucous: stems terete: stipules broadly reniform, glaucous: leaves broadly cordate, obtuse or shortly acuminated, entire or the large ones angled, with small bristly serratures: cymes compound, with 3–5-primary divisions; ultimate branches umbellate: petals distinct: style slender: stigma slightly capitate: fruit globose (size of a pea), about 1-seeded.—*Wight! cat. n.* 418.—V. Kleinii, *Wall.! L. n.* 6008. *a. b.*—Cissus glauca, *Roxb. fl. Ind.* 1. *p.* 406; (*ed. Wall.*) 1. *p.* 425; *DC. prod.* 1. *p.* 628; *Spr. syst.* 1. *p.* 447.—C. purpureus, *Roxb. in E. I. C. mus. tab.* 540.

The leaves become blackish in drying.

416. (8) V. *adnata* (Wall.:) young parts densely pubescent: young shoots 4-angled: stipules oval, adnate, with a flat gland in their lower half: leaves broadly cordate, acuminated, entire, with bristly serratures; under side covered with dense and often rusty coloured tomentum; upper at first pubescent, at length nearly glabrous: umbels peduncled, rays again umbelliferous: petals distinct: style as long as the ovary: stigma capitate: fruit (size of a pea) usually 1-celled: seeds usually solitary.—*Wall.! L. n.* 5998; *Wight! cat. n.* 408.—V. repens, *Wall.! L. n.* 5999. *b.*—Cissus adnata, *Roxb.! fl. Ind.* 1. *p.* 405; (*ed Wall.*) 1. *p.* 423; *in E. I. C. mus. tab.* 1787; *DC. prod.* 1. *p.* 627. *Spr. syst.* 1. *p.* 447.—C. latifolia, *Vahl.* (not *Lam.*) *symb.* 3. *p.* 18; *DC. prod.* 1. *p.* 628; *Spr. syst.* 1. *p.* 447.

We have examined Wallich's n. 5998, *a, b, d, e, f* (as to "*C. vitiginea*"), and *h*, and find them to accord, although some of them have smaller and firmer leaves, with less rusty pubescence than others: from a casual glance at the other letters, we have every reason to think them also the same. To this species is closely allied the *C. vitiginea* of Willdenow in the Enum. hort. Berol., and of De Candolle! and perhaps of Vahl, as well as of those botanists who are only acquainted with the cultivated plant of that name; it, however, has much rounder and broader leaves than *V. adnata*; we have not seen its fruit, nor, perhaps, does that described by Vahl belong to it.

417. (9) V. *Linnæi* (Wall.:) every part covered with a dense short tomentum, except the old stems and the upper side of the leaves becoming at length nearly glabrous: stem and branches terete; young shoots and peduncles compressed: stipules oval: leaves broadly cordate, from 5-angled with the upper angles slightly acute to deeply 5-lobed with the lobes ovate bluntish and the sinus rounded, closely serrated; serratures bluntish: inflorescence compound-umbellate or cymose, peduncled, about as long as the leaves; pedicels in fruit recurved: petals distinct: style conspicuous, longish: fruit oblong, bluish, and glaucous.—*Wall.! L. n.* 5987; *Wight! cat. n.* 420, 421. Cissus vitiginea, *Linn.; herb. Banks!*—C. angulata, *Lam.; DC. prod.* 1. *p.* 629; *Spr. syst.* 1. *p.* 448.—C. Indica, *Kœn! in herb. Banks*; *Pluk. t.* 337. *fol.* 27. *pl.* 2.

When the leaves are lobed with a broad sinus, there is usually a large triangular tooth at the bottom of the sinus. This appears to be the true Linnæan *Cissus vitiginea*; and, we think, the description of the fruit in Vahl,

Digitized by Google

(perhaps copied from Petiver, mus. n. 696.) but not of the rest of the plant, belongs to it. *C. vitiginea*, Willd. en. hort. Ber., is, as we have already mentioned, a species allied to *V. adnata*, and is, we suspect, from its standing the climate of the south of France (whence the specimen before us was obtained), not a native of India, but of Persia, as is stated by Sprengel.

+ + Leaves digitate; leaflets 3–5.

418. (10) V. *Rheedei* (W. & A.:) glabrous: stipules oval: leaves trifoliolate, upper ones often only deeply 3-cleft; leaflets distantly bristle-toothed, oblong-lanceolate, sharply acuminated in the lower part of the stem petiolate, in the upper part sessile, but tapering much at the base; lateral ones unequal sided: umbels compound, about equal to the petiole: petals distinct: style slender, conspicuous: fruit globose, 1-seeded.—*Wight! cat. n.* 431.—V. heterophylla, *Wall.! L. n.* 6036.—Cissus trilobata, *Lam.; DC. prod.* 1. *p.* 629.—C. heterophylla. *Herb. Madr.!* (not *Poir.*).—*Rheed. Mal.* 7. *t.* 45. (good.)

419. (11) V. *setosa* (Wall.:) clothed with scattered glandular bristly hairs, but otherwise glabrous: stem herbaceous: stipules ovate: leaves succulent, trifoliolate, without a common petiole; leaflets stalked, roundish, ovate, or obovate, obtuse, with sharp numerous unequal bristly serratures: cymes peduncled, with divaricating branches: petals distinct: elevated part of the torus 4-lobed, lobes large and gland-like: style conspicuous: berries (red) ovoid, hairy, 1-seeded.—*Wall.! L. n.* 6009; *Wight! cat. n.* 422.—Cissus setosus, *Roxb.! fl. Ind.* 1. *p.* 410; (*ed. Wall.*) 1. *p.* 428; *in E. I. C. mus. tab.* 542; *DC. prod.* 1. *p.* 630; *Spr. syst.* 1. *p.* 448.

420. (12) V. *carnosa* (Wall.:) young parts clothed with a short dense pubescence, older glabrous: stem compressed, striated: stipules oblong: leaves trifoliolate on longish petioles; leaflets stalked, roundish or ovate or obovate, acute or obtuse, crenate-serrated: cymes peduncled, compound: petals distinct: style conspicuous: berries black, 2–4-seeded.—Cissus carnosa, *Roxb. fl. Ind.* 1. *p.* 409; (*ed. Wall.*) 1. *p.* 427.—α; leaflets ovate, acute or acuminated.—C. carnosa, *Wall.!, L. n.* 6018.—V. crenata, *Wall.! L. n.* 6021, *e, f.*—C. acida, *Roxb. in E. I. C. mus. tab.* 541.—C. cinerea, *Lam.; DC. prod.* 1. *p.* 631; *Spr. syst.* 1. *p.* 448.—*Rheed. Mal.* 7. *t.* 9; *Rumph. Amb.* 5. *t.* 166. *f.* 2.—β; leaflets ovate, bluntish.—*Wight! cat. n.* 424, 426.—V. crenata, *Wall.! L. n.* 6021, *a, b, g.*—V. auriculata, *Wall.! L. n.* 6031. *b.*—Cissus carnosa, *Lam.; Vahl, symb.* 3. *p.* 19; *DC. prod.* 1. *p.* 630; *Spr. syst.* 1. *p.* 449.—γ; leaflets roundish.—*Wight! cat. n.* 426. *b.*—V. crenata, *Wall.! L. n.* 6021. *c.*—Cissus crenata, *Vahl! symb.* 3. *p.* 19; *DC. prod.* 1. *p.* 631; *Spr. syst.* 1. *p.* 449.—δ; leaflets obovate, obtuse.—*Wight! cat. n.* 425.—V. crenata, *Wall.! L. n.* 6021. *d.*—Cissus obtusifolia, *Lam.*

Perhaps the above ought not even to be reckoned as varieties, as they sometimes pass from one to the other on the same individual. The specimen of *Cissus acida* in the Linnæan herbarium appears scarcely distinct, but the true plant is from the West Indies. Pluk. t. 152. f. 2 (Bryonioides trifoliatum *indicum*) seems intermediate between our γ and δ.

421. (13) V. *Roxburghii* (W. & A.:) glabrous: stems woody; branches flexuose, terete, with smooth shining bark: leaves petioled, trifoliolate, occasionally with 4 (or 5 ?) leaflets and digitate; leaflets stalked, membranaceous, slightly repand; lateral ones ovate or oblong-lanceolate, attenuated at both extremities; cymes peduncled, much shorter than the petiole, axillary, dichotomous: petals distinct: elevated part of the torus turbinate, 4-lobed: style conspicuous: fruit globose, 2–4-seeded.—*Wight! cat. n.* 427.—Cissus feminea, *Roxb. fl. Ind.* 1. *p.* 410; (*ed. Wall.*) 1. *p.* 429; *in E. I. C. mus. tab.* 543; *DC. prod.* 1. *p.* 630; *Spr. syst.* 1. *p.* 450.

The flowers in our specimens appear bisexual, but this is the only Peninsular species which at all accords with *C. feminea*, Roxb., and we have accord-

Digitized by Google

ingly referred to it: if we be correct, Roxburgh, in his description and figure, must have mistaken the elevated part of the torus for a large stigma. The cymes approach almost to the state of a panicle. Wallich does not seem to be acquainted with it.

*422. (14) V. *elongata* (Wall.:) glabrous: young shoots succulent, shining: stipules small, cordate: leaves petioled, digitate; leaflets 5, stalked, oblong-lanceolate, distantly serrated, glabrous on both sides: peduncles scarcely so long as the petiole: cymes compound, primary branches about 3: petals distinct: style conspicuous, slender: fruit (black, the size of a cherry,) turbinate-globose, 1-seeded.—*Wall.! L. n.* 6016.—C. elongata, *Roxb.! fl. Ind.* 1. *p.* 411; (*ed. Wall.*) 1. *p.* 429; *in E. I. C. mus. tab.* 1528; *DC. prod.* 1. *p.* 632; *Spr. syst.* 1. *p.* 450.——Mountains of Coromandel; *Roxburgh.*

Probably Roxburgh's Coromandel specimens may belong to our last species, as none, that we know of, exist in any herbarium from the Peninsula.

423. (15) V. *muricata* (Wall.:) unisexual, glabrous except the densely pubescent inflorescence: stem woody; branches terete, with a rugulose, muricated bark: leaves petioled, trifoliolate; leaflets stalked, firm and somewhat coriaceous, distantly serrated (the serratures shallow, tipped with a hardened gland), oblong, acuminated; lateral ones broader, unequal-sided: umbels shortly peduncled, with bracteas at the base of the peduncle, axillary, not so long as the petiole, twice compound, with 3–5 primary branches: petals distinct: style very short, thick: stigma large, capitate, somewhat lobed: fruit globose (about the size of a cherry), 2–4-seeded.—*Wall.! L. n.* 6015; *Wight! cat. n.* 432.—V. lanceolaria, *Wall.! L. n.* 6013, *e, i, and a spec. from Finlayson's herb.—Rheed. Mal.* 7. *t.* 8.

Can this be a variety of *V. lanceolaria*?

+ + + Leaves pedate.

424. (16) V. *lanceolaria* (Wall.:) unisexual; glabrous except the pubescent inflorescence: stem woody; branches terete, with a muricated bark: leaves petioled, pedate; leaflets 5, stalked, oblong-lanceolate, between fleshy and coriaceous, distantly serrated (the serratures shallow, tipped a hardened gland); outer ones of each of the lateral pairs unequal-sided: umbels shortly peduncled, with bracteas at the base of the peduncle, axillary, not so long as the petiole, twice compound, with 3–5 primary branches: petals distinct; style short, thick: stigma large, capitate, somewhat lobed: fruit nearly globose, 2–4-seeded.—*Wall.! L. n.* 6013, *a–d, h; Wight! cat. n.* 433 (fem.), 966 (male).—Cissus lanceolaria, *Roxb.! fl. Ind.* 1. *p.* 412; (*ed. Wall.*) 1. *p.* 430; *DC. prod.* 1. *p.* 632; *Spr. syst. suppl. p.* 61.

We have not examined Wall. L. n. 6013. *f, g; k* has only 3 leaflets, and appears the same with *V. angustifolia*, Wall. L. n. 6033; the other letters we have referred to.

425. (17) V. *serratifolia* (W. & A.:) glabrous: stem woody; branches terete, with a smooth and slightly glaucous bark: leaves petioled, pedate; leaflets 7, 3 on each of the lateral secondary petioles and one on the terminal, stalked, oblong-lanceolate, between fleshy and coriacious, distantly serrated (the serratures shallow, tipped with a hardened gland): inflorescence shortly peduncled, axillary, glabrous, with bracteas at the base of the peduncle.—*Wight! cat. n.* 429.—Cissus serratifolia, *Rottl.!; Wight! in Hook. bot. misc.* 2. *p.* 104. *suppl. t.* 6.——Nundidroog; *Rottler.*

The only specimen of this we have seen resembles so much our *C. lanceolaria*, particularly Wight's cat. n. 433, that we could almost suppose it to be a luxuriant form of it: at the same time, it has more numerous leaflets, and wants the little tubercles on the branches.

426. (18) V. *pedata* (Wall.:) young parts softly pubescent, and sometimes also hairy: stipules cordate, acute: leaves petioled, pedate; leaflets 7–11,

Digitized by Google

3–5 placed pedately on each of the lateral secondary petioles and one on the terminal, stalked, oblong-lanceolate, acuminated, membranaceous, with shallow serratures: inflorescence peduncled; peduncles bracteated about the middle, axillary or opposite to the leaves, half of the length of the petiole, with two divaricating branches, each bearing a compound cyme: petals distinct: style conspicuous: fruit flattened on the top, with usually 4 lobes and seeds.—*Wall.! L. n.* 6027; *Wight! cat. n.* 428.—Cissus pedata, *Lam.*; *Vahl!*; *Roxb.! fl. Ind.* 1. *p.* 413; (*ed. Wall.*) 1. *p.* 431; *DC. prod.* 1. *p.* 632; *Spr. syst.* 1. *p.* 450.—C. heptaphylla, *Retz.*; *Roxb. in E. I. C. mus. tab.* 544.—Melothria Zeylanica, *Koen.! in herb. Banks.—Rheed. Mal.* 7. *t.* 10.

427. (19) V. *auriculata* (Wall.:) young shoots succulent and petioles and inflorescence softly pubescent: stipules large, linear-oblong, recurved: leaves long-petioled, with 5 leaflets, pedate or sometimes digitate; leaflets (when pedate) 2 on each of the lateral partial petioles and 1 on the terminal, stalked, oblong-obovate or rhomboid with a short sudden acumination, with shallow serratures; upper side glabrous, under softly pubescent: peduncles about the length of the petioles, axillary or terminal, bearing a divaricately 2–3-chotomous and much branched cyme: petals distinct: style slender: fruit (red, the size shape and appearance of a ripe cherry) globose, 1-seeded.—*Wall.! L. n.* 6031. *a, c*; *Wight! cat. n.* 967.—Cissus auriculata, *Roxb. fl. Ind.* 1. *p.* 411; (*ed. Wall.*) 1. *p.* 430; *in E. I. C. mus. tab.* 1788; *DC. prod.* 1. *p.* 632; *Spr. syst.* 1. *p.* 450.——Southern Provinces.

Dr Wallich's specimens from Bengal and Ava, and Roxburgh's figure and description from the plant in the Calcutta garden, sent by Heyne from Mysore, agree in having the leaves digitate: whereas our specimens from the Peninsula approach more near to the *V. pedata*, and have them pedate: yet we do not consider them distinct species: all have the same remarkable stipules. *V. elongata*, Wall. or *Cissus elongata* of Roxburgh, presents also the same kind of variation: indeed there we have seen both pedate and digitate leaves on the same specimen: such instances are, however, rare in this genus. Wallich's n. 6031. *b* belongs to *V. carnosa*.

428. (20) V. *tenuifolia* (W. & A.:) glabrous: young shoots angled: leaves petioled, pedate; leaflets 5–7, two or three on each of the lateral partial petioles and very shortly stalked, one on the terminal, sometimes long-stalked, oblong, acute at both ends, cuneate at the base, coarsely serrated, serratures tipped with an awn-like mucro: peduncles axillary, shorter than the petiole; cymes dichotomous, few-flowered (most of the flowers deciduous): petals distinct: style rather short: stigma capitate: fruit (the size of a pea) turbinate-globose, 1-seeded: seed irregularly many-angled.—*Wight! cat. n.* 430. —V. paniculata, *Wall.! n.* 6022. *a.* (excl. "*C. paniculata*"), *b.*

We adopt the name *V. tenuifolia*, instead of *V. paniculata* given to this by Dr Wallich, because the inflorescence is not panicled; and because a specimen which was mixed in the same sheet with *V. tenuifolia*, (both under Wall. L. n. 6022. *a*), and therefore most probably corresponding to *Cissus paniculata*, Heyne, has cordate simple leaves, and appears a badly dried one of our *V. pallida*.—The leaves turn black in drying. On the young shoots they are sometimes trifoliolate, the lateral leaflets being then more or less lobed, which makes us suspect, especially as Poiret had not seen either flower or fruit, that his *Cissus acutifolia* (DC. prod. 1. p. 630, Spr. syst. 1. p. 449,) was a young shoot of *V. tenuifolia*. Our plant is very closely allied to *C. Japonica*, of which, however, the specimen now before us, from Canton in China, has the leaflets much more obtuse, and the peduncles greatly longer. In character also, *C. serrulata*, Roxb., so much approaches ours, that we had united them, but Dr Wallich's specimens (List, n. 6034) do not turn black in drying, and have the lateral leaflets on much longer stalks. *V. cymosa*, Wall. L. n. 6017, has the foliage of ours, but the inflorescence is much larger. Whether De Candolle's *C. nepalensis* be referable to *V. serrulata* or *V. cymosa*, is not

Digitized by Google

easy of determination from the very short character he has given: we incline, however, to place it under the former.

§ 2. *Petals 5, distinct or united at the apex: stamens 5: style usually conical, short, truncated, and scarcely distinguishable from the apex of the ovary.—Flower-bearing peduncles sometimes changed partly into tendrils.* Vitis, *Linn.; Lam. ill. t.* 145.

* 429. (21) V. *vinifera* (Linn.:) leaves simple, lobed, toothed or serrated or incise, glabrous or tomentose: flowers bisexual in compound peduncled racemes; flower-bearing peduncles not cirrhiferous: petals united at the apex: stamens slender, longer than the pistillum: ovary girt at the base by the elevated part of the torus, not furrowed: style short, thick: stigma slightly capitate.—*DC. prod.* 1. *p.* 633; *Spr. syst.* 1. *p.* 777; *Wight! cat. n.* 407.

430. (22) V. *latifolia* (Roxb.:) branches glabrous: leaves simple, roundish-cordate, with 3–7 acute angles or lobes, sometimes palmate (the segments with a rounded sinus, oblong, acute, and again lobed), serrated, unexpanded ones with tomentum, adult ones glabrous on both sides, prominently nerved beneath: racemes pubescent, compound, peduncled; flower-bearing peduncles partly cirrhiferous: flowers bisexual: petals distinct: ovary immersed in the elevated part of the torus, 10-furrowed at the apex: style none: stigma concave: fruit (about the size of a black currant) globose.—*Roxb. hort. Bengh. p.* 18; *fl. Ind.* 1. *p.* 661; (*ed. Wall.*) 2. *p.* 474; *in E. I. C. mus. tab.* 1224; *Wight! cat. n.* 415, 415. *bis*, 416, 970.—V. glabrata, *Heyne in Roth. nov. sp. p.* 156; *DC. prod.* 1. *p.* 634; *Spr. syst.* 1. *p.* 778.—V. Indica, *Wall.! L. n.* 5993, *c, d.*—V. Kleinii, *Wall.! L. n.* 6008, *c, d.*—*Rheed. Mal.* 7. *t.* 11?——Low hills on the Coromandel coast.

We ourselves have not seen Wall. L. n. 6008, *e, f*, but understand they are quite the same with *c, d*, above referred to.

431. (23) V. *erioclada* (W. & A.:) branches, peduncles, and pedicels densely woolly: leaves simple, roundish cordate, acutely angled or lobed, sometimes palmately lobed with a rounded sinus, repand-toothed, teeth tipped with a large hardened gland; adult ones brittle, glabrous or with a little scattered flocculent tomentum, shining and strongly nerved beneath: racemes peduncled, compound, compact; peduncles partly cirrhiferous; flowers bisexual, when young nearly concealed among the wool of the pedicels: petals distinct: ovary immersed in the elevated part of the torus, 10-furrowed at the apex: style none: stigma concave: fruit (about the size of a ripe grape) oblong.—*Wight! cat. n.* 968.—*Rheed. Mal.* 7. *t.* 7.

Rheede in his description says, "caulis nonnihil *viscosus*," an obvious mistake of the printer for *villosus*; but which, notwithstanding that the racemes are figured enveloped in wool, has led Roxburgh to consider Rheede's plant to be the same with *V. latifolia*. The two appear to us very distinct.

432. (24) V. *tomentosa* (Heyne:) stems, petioles, peduncles and pedicels woolly: leaves roundish-cordate, 3–5-lobed or partite; lobes toothed, more or less acute, occasionally obtuse; under side tomentose, upper becoming pubescent or floccose: racemes peduncled, short, compact, corymbiform, with usually two primary branches; peduncles cirrhiferous: flowers bisexual: petals distinct: ovary immersed in the torus, 10-furrowed at the apex: style none: stigma concave.—*α*; leaves 3–5-lobed; lobes occasionally deep with a rounded sinus, and sometimes again lobed.—*Wight! cat. n.* 410, 411.—V. tomentosa, *Heyne in Roth. nov. sp. p.* 157; *DC. prod.* 1. *p.* 634.—V. triloba, *Heyne in Roth. nov. sp. p.* 157; *DC. prod.* 1. *p.* 634; *Spr. syst.* 1. *p.* 778; *Wall.! L. n.* 6004, *a, b.*—V. trifida, *Roth. nov. sp. p.* 157; *DC. prod.* 1. *p.* 634. —*β*; leaves 3–5-partite, or occasionally almost pedate; segments acuminated. —*Wight! cat. n.* 417.—V. ternata, *Heyne in Roth. nov. sp. p.* 157; *Spr. syst.*

Digitized by Google

1. *p.* 776.—V. triloba, *Wall.! L. n.* 6004, *c.*—V. cinnamomea, *Wall.! L. n.* 5989, *c.*—Ampelopsis ternata, *DC. prod.* 1. *p.* 633.

The acute and obtuse lobes occur on the same specimen, and even on the same leaf, so that there is no difference between *V. trifida* and *V. triloba*: the larger leaves are always more deeply lobed than the upper or smaller ones, whence we cannot separate either of these from Heyne's *V. tomentosa*. As to *V. ternata*, Heyne, it has a somewhat different aspect, but it really differs in no respect except in the more deeply divided leaves; we have, therefore, also united it, the leaves in this section of the genus being very subject to vary.

433. (25) V. *lanata* (Roxb.:) stems, petioles, peduncles and pedicels woolly: leaves cordate-ovate, serrated; under side tomentose with rusty-coloured wool; upper glabrescent: racemes peduncled, elongated, compound, with usually two primary branches; flower-bearing peduncles often cirrhiferous: flowers bisexual: petals united at the apex: stamens much longer than the ovary: ovary inclosed in the elevated part of the torus: style none: stigma concave: fruit (size of a pea) globose, 1-seeded.—*Roxb. fl. Ind.* 1. *p.* 661; *(ed. Wall.)* 2. *p.* 474; *in E. I. C. mus. tab.* 584; *Wall.! L. n.* 5995, *a, b; Wight! cat. n.* 969.—V. rugosa, *Wall.! L. n.* 5994, *a, c? e, f.*—V. aquosa, *Wall.!? L. n.* 6000, *c.*—V. cordifolia, *Roth. nov. sp. p.* 158.—V. Heyneana, *DC. prod.* 1. *p.* 634.——Circars; *Roxburgh.*

Wall! L. n. 5995, *c, d,* and n. 5994, *b, g,* appear to us to belong to *V. barbata*, Wall.! L. n. 5997: as to n. 5994, *d,* it certainly is *V. Indica.* We have carefully examined Wall. L. n. 4994, *a, e, f* (the first of which letters, from Nepal, is supposed to be the type of *V. rugosa*, Wall.), but do not perceive that the petals, unless accidentally, separate before they fall off; whence we cannot avoid suspecting that the specimens from which Dr Wallich drew up his description in his edition of Roxburgh's fl. Ind. 2. p. 480, are not among those noticed in his List: indeed his whole description, especially the "corymb ovate, dense," applies almost exactly to our *V. tomentosa.* We are doubtful about Wall. L. n. 5994, *c,* the specimen before us being very imperfect.

434. (26) V. *Indica* (Linn.:) branches, petioles, and peduncles villous: leaves cordate, scarcely angled or lobed, toothed, the teeth tipped with a hardened gland; under side tomentose; upper floccose, at length somewhat glabrous: racemes peduncled, cylindrical, composed of lateral umbels nearly sessile along the rachis: peduncles cirrhiferous: flowers bisexual: petals distinct: ovary immersed in the elevated part of the torus: style none: stigma concave: fruit globose, 1–2-seeded.—*DC. prod.* 1. *p.* 634; *Spr. syst.* 1. *p.* 777; *Roxb.! fl. Ind.* 1. *p.* 660; *(ed. Wall.)* 2. *p.* 473; *Wall.! L. n.* 5993, *a, b; Wight! cat. n.* 412.—V. rugosa, *Wall.! L. n.* 5994, *d.—Rheed. Mal.* 7. *t.* 6.

Wall. L. n. 5993, *c, d,* we have referred to *V. latifolia*, Roxb.

II. LEEA. *Linn.*—Aquilicia, *Linn.; Lam. ill. t.* 139.

Calyx 5-cleft. Petals 5, combined at the base. Torus thin and fleshy, lining the tube of the calyx, bearing on the inside at its base around the ovary the corolla and a stamen-tube. Tube or urceolus combined with the corolla at the base, 5-lobed, with an external groove running down from each cleft; lobes (sterile stamens) alternate with the segments of the corolla: filaments (fertile) combined with the back of the tube, free from the commencement of the grooves, alternate with its segments and opposite to the petals, inflected between the segments of the tube, and then bent downwards: anthers attached by their middle to the filaments, usually syngenesious or combined by their edges, sometimes distinct. Ovary partly immersed in the torus, 6-celled: ovule solitary in each cell, erect. Style and stigma simple. Berry 3–6-celled.

Digitized by Google

—Herbaceous, shrubby, or slightly arborescent. Tendrils none. Leaves rarely simple, usually pinnate, or bi-tri-pinnate.

435. (1) L. *robusta* (Roxb.:) shrubby; young shoots harsh with a coarse short pubescence: leaves bi-tri-pinnate; leaflets ovate-lanceolate, lateral ones with a broad cordate base, serrated, cuspidate, under side hairy: stipules villous, caducous: cymes supra-decompound, villous: stamen-tube urceolate, segments with a thin rounded apex; anthers linear-oblong, syngenesious.—*Roxb. fl. Ind.* 1. *p.* 655; *(ed. Wall.)* 2. *p.* 468; *Spr. syst. supp. p.* 70; *Wall. L. n.* 6826.——Circars; *Roxburgh.*

We have not seen this: a specimen now before us, so marked and transmitted by Dr Carey of Serampore, is certainly referable to *L. Staphylea*, Roxb.

436. (2) L. *integrifolia* (Roxb.:) arborescent: leaves super-compound, lower pair of pinnæ bipinnate; leaflets lanceolate or linear-lanceolate, acuminated, quite entire or very slightly serrated; upper side glabrous, under very slightly downy: corymbs super-decompound: tube of the corolla shorter than the calyx: stamen-tube cylindrical with the grooves running down almost to the line of union with the corolla; lobes emarginate: anthers oblong, pointed, syngenesious.—*Roxb. fl. Ind.* 1. *p.* 659; *(ed. Wall.)* 2. *p.* 472; *Spr. syst. suppl. p.* 70.——Moist valleys among the Circars; *Roxburgh.*

With this also we are unacquainted, nor is it in Dr Wallich's List. In both we have slightly altered Roxburgh's character, as he evidently has mistaken throughout the whole genus the external furrow or groove on the back of the stamen-tube for a continuation of the cleft.

437. (3) L. *Staphylea* (Roxb.:) shrubby: branches terete, glabrous, not furrowed or very slightly so: leaves from compound to super-decompound; leaflets from oblong with a shortish point to linear-lanceolate, with a long tapering point, coarsely serrated, glabrous on both sides: cymes super-decompound, glabrous or with the ultimate branches scabrous-pubescent: stamen-tube urceolate, the external grooves disappearing above the line of union with the corolla; lobes emarginate: anthers broadly oblong, syngenesious.

α: leaflets firm; flowers larger; stamen-tube conical-urceolate, coriaceous, with the grooves disappearing about the middle.—(1); leaflets narrow-lanceolate, with a long taper-point.—*Wight! cat. n.* 972.—*Roxb. fl. Ind.* 1. *p.* 658; *(ed. Wall.)* 2. *p.* 471; *Spr. syst. suppl. p.* 70; *Wall. L. n.* 6824 (partly).—L. Ottilis, *DC. prod.* 1. *p.* 636.—L. æquata, *Roxb. in E. I. C. mus. tab.* 195.—Staphylea? Indica, *Burm. Ind. t.* 24. *f.* 2.—Aquilicia Ottilis, *Gærtn. fr.* 1. *p.* 275.—Ottilis Zeylanica, *Gærtn. fr. t.* 27.—(2); leaflets ovate-oblong, with a short acumination.—*Wight! cat. n.* 434, 435.—L. Staphyllea, *Wall. L. n.* 6824. *b.*—*Rheed. Mal.* 2. *t.* 26.

β: leaflets more membranaceous; flowers smaller; stamen-tube short-urceolate, somewhat fleshy, with the grooves reaching down nearly to the line of union with the corolla.—*Wight! cat. n.* 971.

We feel quite certain that the narrow-leaved state is the plant of Roxburgh, and that our broad-leaved one is that of Rheede. Hamilton (Linn. Soc. Tr. 14. p. 226) considers Rheede's plant to be different from Burmann's, and to be *L. æquata* of Linn.; and certainly a specimen of that species before us, from the English gardens, seems noway distinct from the broad-leaved form of *L. Staphylea*: Linnæus, however, says that the true *L. æquata* has pubescent stems. As to *L. sambucina* (Roxb. in E. I. C. mus. tab. 1373), we have not examined it, unless a species we have from the Mauritius, with the leaflets cordate at the base, be the same: De Candolle and most authors, indeed, give the Mauritius as a locality; but we are inclined to suspect the Mauritius plant to be *L. arborea*, Telf., which Dr Wallich doubtfully refers to *L. Staphylea* (L. n. 6824, *l*). Roxburgh gives no character to separate *L. sambucina*

Digitized by Google

from *L. Staphylea*, except the slightly furrowed stem of the former, and we have occasionally seen the young shoots of the other likewise furrowed. We fear that in this genus neither the pubescence, nor the angled stems, are of sufficient importance for the discrimination of species.

ORDER XLI.—GERANIACEÆ. *Juss.*

Sepals 5, persistent, more or less unequal, or sometimes produced at the base into a spur that is connate with the pedicel: æstivation imbricated. Petals 5 (or, by abortion 4, rarely 0), unguiculate, equal and hypogynous, or unequal and either connected at their base or inserted on the calyx: æstivation twisted. Stamens rarely free, usually monadelphous at the base, hypogynous or perigynous, twice or thrice as many as the petals (some occasionally abortive). Ovarium 5-celled: ovules 2 in each cell, pendulous: styles 5, cohering round a central elongated axis or torus. Fruit of 5 membranous 1-celled indehiscent carpels, which at first are close pressed to the base of the torus; each ending in the style (or *awn*) that is closely adnate to the angles of the torus, but after maturity twists variously from the base to the apex and carries the pericarp along with it. Seed solitary in each carpel, peritropal. Albumen 0. Embryo curved: radicle superior, but with its extremity bent down towards the hilum: cotyledons inferior, foliaceous, convolutely or flexuosely plaited.—Leaves simple, stipulate, opposite, or alternate, with peduncles opposite to them.

We omit here *Pelargonium zonale*, Willd. (Wight! cat. n. 436), *P. Radula*, Ait. (Wight! cat. n. 437), and *P. glomeratum*, Jacq. (Wight! cat. n. 973), both being cultivated in the Peninsula, and natives of the Cape of Good Hope.

I. GERANIUM. *Linn.; L'Her.; Lam. ill. t. 573. f. 1; Gærtn. fr. t. 79.*

Sepals 5, equal. Petals 5, equal. Stamens 10, all fertile; alternate ones larger with a nectariferous gland at their base. Awns of the carpels with their inner side glabrous, at length separating elastically from the base of the axis upwards, and becoming circinately revolute.—Herbaceous or rarely suffrutescent plants. Leaves palmately lobed. Peduncles 1–2 flowered.

438. (1) G. *affine* (W. & A.:) root fascicled, perennial: stems herbaceous, diffuse, procumbent, angled, and as well as the peduncles and petioles clothed with spreading hairs: leaves 5-lobed, slightly hairy above, villous on the nerves and veins beneath; lobes cuneate-ovate, unequally lobed and toothed, teeth blunt and tipped with a short point: stipules lanceolate, acuminated, ciliated: peduncles much longer than the leaves, 2-flowered: sepals elliptic-oblong, 3- (or sometimes 5-) nerved, blunt, with a mucro about six times shorter than the sepal: petals entire, obovate, nearly twice as long as the calyx: stamens subulate from a broad base, distinct, in a double series, nearly glabrous: pistil villous: carpels hairy; seeds glabrous, reticulated.—*Wight! cat. n.* 438, 439.

While *G. palustre*, *longipes*, *collinum*, and several others, with the same kinds of carpels and seeds, are kept distinct, the present species must be so likewise: but we cannot point out any one certain character to distinguish half of the species of the genus retained by the majority of botanists.

Digitized by Google

ORDER XLII.—LINEÆ. *DC.*

Sepals 4–5, persistent: æstivation imbricated. Petals hypogynous, 4–5, unguiculate, caducous: æstivation twisted. Stamens hypogynous, distinct, as many as the petals, and alternate with them (with intermediate teeth or abortive stamens), arising from an annular torus: anthers ovate, erect. Ovarium with as many (rarely fewer) cells as stamens: styles 3–5, distinct or more or less combined: stigmas capitate or simple. Capsule generally pointed with the hardened base of the styles, plurilocular; each cell spuriously bilocular, and opening by two valves at the apex. Seeds solitary in each spurious cell, compressed, pendulous. Albumen thin, fleshy. Embryo straight: radicle next the hilum: cotyledons flat.—Leaves entire, alternate, without stipules, sometimes with two glands at the base. Flowers terminal.

I. LINUM. *Linn.; Gærtn. fr. t.* 102; *Lam. ill. t.* 219.

Sepals 5, distinct, entire, quite entire or serrated. Petals 5. Stamens 5. Styles 3–5, distinct from the base, or combined to the middle or apex.

439. (1) L. ***Mysorense*** (Heyne:) glabrous, erect: leaves alternate, oblong, bluntish, tapering to the base: flowers paniculately corymbose: sepals ovate, somewhat acute, with rather ciliated margins: petals (yellow) scarcely longer than the calyx: styles connate at the base: stigmas globose: capsule acutely mucronate.—*Benth. in Bot. Reg. under t.* 1326; *G. Don in Mill. dict.* 1. *p.* 451; *Wall.! L. n.* 1507; *Wight! cat. n.* 164.——Mysore. Neelgherries.

440. (2) L. ***trigynum*** (Roxb.:) shrubby, glabrous: leaves alternate, elliptical, pointed at both ends, feather-nerved, minutely serrulated: flowers (large and yellow) solitary, peduncled, the peduncles bracteated at the base: sepals lanceolate: petals obovate, emarginate, with two small toothlets at the top of the claws: styles 3, distinct: capsule globular, obtuse.—*Roxb.! fl. Ind.* 2. *p.* 110; *in E. I. C. mus. t.* 1048; *Sim's Bot. Mag. t.* 1100; *DC. prod.* 1. *p.* 425 (partly); *Spr. syst.* 1. *p.* 965; *G. Don in Mill. dict.* 1. *p.* 452; *Wall.! L. n.* 1505, *c–g*; *Wight! cat. n.* 974.

We believe that this is only known in a state of cultivation; but we think it probable that it is a native of the mountains of the Peninsula only, and that the Bengal and Nepal plant is *L. repens*, Don (*L. trigynum*, Sm. Exot. bot. t. 17).

441. (3) L. ***usitatissimum*** (Linn.:) annual, erect, glabrous: leaves lanceolate or linear, acute: panicle corymbose: sepals ovate, acute or mucronate, with scarious or membranaceous margins, 3-nerved: petals (blue) slightly crenated, three times larger than the calyx.—*DC. prod.* 1. *p.* 426; *Spr. syst.* 1. *p.* 961; *Roxb. fl. Ind.* 2. *p.* 110; *Wall.! L. n.* 1504; *Wight! cat. n.* 164, *bis.*—Neelgherries.

ORDER XLIII.—BALSAMINEÆ. *Rich.*

Sepals 5, deciduous, the two inner (or upper) usually connate, the lowest spurred or gibbous: æstivation imbricative. Petals hypogynous, usually 4 (5, but the fifth or posterior one abortive), and united by pairs; rarely 5 and distinct. Stamens 5, hypogynous: filaments subu-

Digitized by Google

late: anthers 2-celled. Ovarium solitary, 5-celled: ovules usually numerous, rarely few in each cell, suspended: stigmas 5, sessile, distinct or more or less united. Fruit capsular, 5-celled (the dissepiments usually disappearing), rarely (in the drupe) solitary, 5-valved, elastically septifrage; or a 5-celled drupe. Seeds several in each cell. Albumen 0. Embryo straight: radicle next the hilum: cotyledons planoconvex.—Succulent herbaceous plants. Leaves simple, opposite or alternate, exstipulate. Flowers axillary.

IMPATIENS. *Linn.; Lam. ill. t.* 725.—Balsamina, *Gærtn. fr. t.* 151.

Sepals 5, apparently only 4 from the union of the two upper ones. Petals 4, apparently only 2 from the union of each of the lower to each of the lateral ones. Filaments 5, more or less united at the apex: anthers opening longitudinally or transversely. Ovarium 5-celled; cells formed by membranous projections of the placentæ which occupy the axis of the ovary and are connected with its apex by 5 slender threads. Capsule elastically 5-valved, often 1-celled by the disappearance of the dissepiments. Seeds numerous or few.

In the following specific characters we shall, for simplicity, call the pair of combined sepals a posterior sepal, and each pair of combined petals a single 2-lobed petal. In some botanical works the lower sepal which is spurred is called a nectary, but is generally viewed as a petal, and so is also the combined upper pair of sepals; from which latter cause, and their being very petaloid, *I. tripetala*, Roxb. obtained its name.—We regret that we cannot adopt the division into *Impatiens* and *Balsamina* as defined by De Candolle. In the many species which we have examined, we have not in a single instance found 1-celled anthers: the circumstance of the stigmas being united or distinct seems quite independent of the mode of opening of the capsules, and is certainly independent of the habit assigned to the two genera of the 1- or many-flowered peduncles. Nor are we disposed to make use of the different dehiscence of the fruit, unsupported by other permanent characters, from this other reason, that it cannot be observed unless the fruit be ready to burst, and is lost the moment it does burst: this being of very little use in a practical point of view. But as it is desirable that the genus be divided, and as the species with alternate and those with opposite leaves form two pretty distinct groups, we have arranged them accordingly: the former have the lateral sepals usually minute and caducous; the latter about as long and often as permanent as the anterior and posterior ones. *I. latifolia* might thus fall into the first tribe, with which the habit, the fruit, and the leaves imperfectly opposite, better accord. The peduncles 1- or many-flowered, may be useful for subdividing these sections, particularly as we have reason to suspect that corresponding differences exist in the mode of dehiscence of the anthers, combined with the more or less perfect union of the filaments near the apex. For specific characters, in addition to those we have mentioned as proper for sections, the size and shape of the upper pair of sepals, the shape of the lower sepal and that of the lobes of the united petals, form together the best marks of distinction; but all the species require to be studied, for this purpose, when growing, the blossoms being usually too tender for such examination in the herbarium. Several of the following characters, having been taken (when we had no materials of our own) from a hurried inspection of specimens in the Linnean Society's Indian herbarium, are imperfect; we trust, however, that they will suffice for the discrimination of the species.

§ 1. *Leaves alternate; pedicels axillary, solitary or several together, 1-flowered.*

442. (1) I. *Balsamina* (Linn.:) herbaceous, erect, simple; young shoots hairy: leaves alternate, petioled, glabrous, acuminated at both ends, acutely and often deeply serrated: petioles glanduliferous, pubescent or hairy: pedicels 1–2 or more, aggregate, densely pubescent, much shorter than the leaves: lateral sepals minute, lanceolate; anterior one pubescent, infundibuliform, with a slender spur either longer or shorter than the flower: capsule ovate, tomentose and hairy with rigid shining (yellow) bristles.

Digitized by Google

1: *vulgaris;* leaves large, broad-lanceolate; flowers large, about as long or longer than the spur.—*α, hortensis;* flowers longer than the spur. —*Wight! cat. n.* 980.—I. Balsamina, *Linn.!; Willd. sp. pl.* 1. *p.* 1175; *Lam. ill. t.* 725; *Roxb. fl. Ind.* 1. *p.* 651; *(ed. Wall.)* 2. *p.* 453; *Spr. syst.* 1. *p.* 807; *Wall.! L. n.* 4731.—Balsamina hortensis, *DC. prod.* 1. *p.* 685; *Rumph. amb.* 5. *t.* 90; *Rheed. Mal.* 9. *t.* 52?——*β, sylvestris;* flowers usually about as long as, or slightly shorter than, the spur.—*Wight! cat. n.* 456.—I. cornuta, *Linn.! in herb. Herm.!; sp. p.* 1328; *Spr. syst.* 1. *p.* 807; *Wall.! L. n.* 4733, *a, c, d.*—I. coccinea, *Sims. in Bot. mag. t.* 1256.—Balsamina cornuta, *DC. prod.* 1. *p.* 686.—B. coccinea, *DC. l. c. p.* 685.—*Burm. Zeyl. t.* 16. *f.* 1 (flower bad).

2: *longifolia;* leaves linear-lanceolate; flowers small, much shorter than the very slender spur.—*Wight! cat. n.* 455.—I. longifolia, *Wight in Wall.! L. n.* 4734.—I. coccinea, *Wall.! L. n.* 4732.—I. cornuta, *Wall.! L. n.* 4733. *b.*

We have referred with doubt to Rheede 9. t. 52, on account of the leaves being represented opposite and the spur saccate with a short horn: at the same time all the other points agree. We fear that the figures of this and of the other species of the genus in Rheede are very incorrect.

443. (2) I. *arcuata* (Wall.:) suffruticose?, diffuse, branched; branches pubescent: leaves alternate, petioled, narrow-lanceolate, small, acuminated at both ends, acutely serrated: petioles short, glanduliferous, pubescent: pedicels 1–2 together, densely pubescent, more than half the length of the leaves: flowers small: lateral sepals lanceolate, much smaller than the others; anterior one densely pubescent, with a slender spur much longer than the flower: capsule ovate, tomentose.—*Wall.! L. n.* 4735; *Wight! cat. n.* 447.

Perhaps this is only a variety of *I. Balsamina.*

444. (3) I. *Leschenaultii* (Wall.:) suffruticose?, erect, branched; branches ascending, almost glabrous: leaves alternate, short petioled, ovate-lanceolate, acuminated, acute at the base, glabrous, with bristly incurved serratures: petioles without glands: pedicels solitary, shorter than the leaves: lateral sepals minute, caducous: spur slender, tapering, rather longer than the flowers, curved upwards: capsules small, drooping, glabrous, ovate, pointed, few-seeded.—*Wall.! L. n.* 4739. *b.; Wight! cat. n.* 449.—Balsamina Leschenaultii, *DC. prod.* 1. *p.* 686.

De Candolle remarks that this species is very nearly allied to *I. latifolia,* in which we agree; but the fruit is here glabrous, not covered with a dense pubescence, and the leaves, although occasionally opposite or nearly so at the top of the branches, on account of their approximation to each other, must be regarded as alternate. It thus appears to be the connecting link between *I. latifolia* and the two species just described, having the corolla of *I. latifolia* and the alternate leaves of the other two: from all of them it is readily distinguished by the glabrous fruit.

445. (4) I. *scabriuscula* (Heyne:) erect, branched, tomentose: leaves alternate, cuspidate-serrated; upper side slightly pubescent; under hairy, particularly on the veins: pedicels aggregate, pubescent, much shorter than the leaves: upper and lower sepals densely clothed with a rusty pubescence, lower gibbous without a spur.—*Heyne! in Roxb. fl. Ind. (ed. Wall.)* 2. *p.* 464; *Wall.! L. n.* 4736 (partly).—Balsamina scabriuscula, *G. Don in Mill. Dict.* 1. *p.* 748.

There is a specimen from China of what appears to be a more glabrous variety of this plant; which Linnæus has put up, in his herbarium, with *I. Balsamina.*

446. (5) I. *pendula* (Heyne:) erect, branched; branches with a line of hairs decurrent from the sides of the base of the short petioles: leaves alter-

Digitized by Google

nate, roundish-oval, sometimes slightly cordate, remotely bristle-serrated; upper side with a few scattered hairs, under glaucous: pedicels axillary, usually solitary, longer than the petioles, hairy, in fruit deflexed: flowers glabrous, minute, spurless: stigmas combined: capsule small, ventricose, few-seeded.—*Wall.! L. n.* 4744.—I. scabriuscula, *Wall.! L. n.* 4736 (partly.)

Allied to the preceding in the spurless flowers, but differing in having them much smaller and glabrous. It has considerably the habit of *I. Chinensis*, but is distinguished from it also by the small inconspicuous flowers.

447. (6) I. *mysorensis* (Roth.:) stems simple, slender, erect: leaves alternate, lanceolate, acuminated at both ends, glabrous: pedicels axillary, filiform, in pairs, about half the length of the leaves: flowers small, longer than the straight spur: capsule densely pubescent, few-seeded.—*Roth. nov. sp. p.* 164; *Spr. syst.* 1. *p.* 807; *Wall.! L. n.* 4743. *c.*; *Wight! cat. n.* 979.—Balsamina mysorensis, *DC. prod.* 1. *p.* 686.

A slender delicate species, approaching *I. Kleinii* and *I. oppositifolia* in habit, but easily distinguished by the alternate leaves.

§ 2. *Leaves alternate; peduncles with several flowers.*

448. (7) I. *umbellata* (Heyne:) erect: leaves alternate, crowded towards the apex of the stem, obovate, obtuse, remotely crenate; upper side sparingly hairy; under glaucous: peduncles about the length of the leaves, bearing 4–5 shortly pedicellate flowers near the apex: flowers large, with a long tapering curved spur.—*Heyne! in Roxb. fl. Ind.* (*ed. Wall.*) 2. *p.* 464; *Wall.! L. n.* 4757.

449. (8) I. *grandis* (Heyne:) erect, nearly glabrous, leaves alternate on long glanduliferous petioles, broadly ovate-lanceolate, acuminated, with remote incurved bristle-serratures: peduncles shorter than the leaves, 3–4-flowered: flowers large, with a very long tapering conical spur.—*Heyne! in Roxb. fl. Ind.* (*ed. Wall.*) 2. *p.* 464; *Wall.! L. n.* 4759.

450. (9) I. *fruticosa* (DC.:) erect, branched: stems glabrous, glaucous: leaves alternate, long-petioled; upper side hairy, particularly on the veins; under tomentose: petioles villous, glanduliferous: peduncles glabrous, shorter than the leaves, dividing into several long 1-flowered pedicels: flowers shorter than the spur: lateral sepals large, concave, roundish-ovate, acuminated: filaments united at the apex: stigmas combined: capsule glabrous, tapering at both ends.—*DC. prod.* 1. *p.* 687; *Spr. syst.* 1. *p.* 808; *Wall.! L. n.* 4762; *Wight! cat. n.* 450.—I. cornuta, var. 2. *Moon? cat. Ceyl. pl. p.* 18.—Balsamina fruticosa, *Lesch!*

451. (10) I. *scapiflora* (Heyne:) glabrous: root tuberous: leaves radical, orbicular, deeply sinuate-cordate, the lobes overlapping, coriaceous; under side paler, marked with numerous coloured nerves: scape bearing a many-flowered raceme, bracteated: pedicels alternate, solitary from each bractea, slender, in fruit becoming deflexed: lateral sepals ovate, small: spur sometimes tumid and inflated, sometimes much elongated: petals 2-lobed; posterior lobe small; anterior elongated, projecting forward.—*Heyne! in Roxb. fl. Ind.* (*ed. Wall.*) 2. *p.* 464; *Wall.! L. n.* 4758; *Wight! cat. n.* 446.—I. bulbosa, *Moon. cat. Ceyl. pl. p.* 18.

Strictly speaking, the scape ought to be viewed as a stem and the bractea as leaves, so that the pedicels are as truly axillary and single-flowered as those of the former section: it is unlike any other species, and we place it here, as the inflorescence would be considered as a scape by most botanists. The anthers are united with a ring round the stigma, are each 2-celled, and open transversely. We hope ere long to have it in our power to point characters sufficient for its separation from the genus.

Digitized by Google

§ 3. *Leaves opposite; pedicels axillary, solitary or aggregate, 1-flowered.*

452. (11) I. *latifolia* (Linn.:) erect, glabrous, or the young parts sprinkled with short shining brittle hairs: leaves membranaceous, oval, acuminated at both ends, petioled, crenate-serrated, with some of the lower serratures glandular; upper ones opposite, lower often alternate: pedicels usually solitary, shorter than the petiole: lateral sepals much smaller than the others; posterior ones petaloid, larger than the petals, concave: spur about the length of the flower: petals deeply 2-lobed, lobes oblong, the anterior the larger: capsule oval, tomentose with short intermixed yellow brittle shining hairs.—*Willd. sp. pl.* 1. *p.* 1174; *Spr. syst.* 1. *p.* 807; *suppl. p.* 89; *Wall.! L. n.* 4737; *Wight! cat. n.* 441, 451, 454.—I. lucida, *Heyne! in Wall.! L. n.* 4738.—I. Leschenaultii, *Wight! in Wall.! L. n.* 4739. *a.*—Balsamina latifolia, *DC. prod.* 1. *p.* 686.—*Rheed. Mal.* 9. *t.* 48.

† 453. (12) I. *Rheedei* (W. & A.:) erect: leaves opposite, sprinkled with a few hairs, ovate-lanceolate, acute, attenuated at the base, crenate-serrated: pedicels aggregate, bent down in fruit, about three times shorter than the leaf: lateral sepals minute, caducous; posterior one concave, as large as the petals; spur longer than the flower, subulate: posterior lobe of the petals minute and inconspicuous, anterior oblong: fruit narrow-oblong, tapering at both ends.—Balsamina Tilo, *DC. prod.* 1. *p.* 686.—*Rheed. Mal.* 9. *t.* 49.

A species scarcely known, but apparently closely allied to our last: here, however, there are only three conspicuous petaloid parts of the flower; in the other there are five. On which account this approaches much to *I. tripetala*, Roxb.; but that species has not been found on the Peninsula, and besides has a spur of a different kind, larger flowers, and an axillary peduncle, bearing several pedicels: it may, however, prove to be *I. tripetala*, for experience shews that no dependence is to be placed on the shape of the spur in old figures, and as to the aggregate pedicels, we find the peduncle so short in *I. tripetala* as to permit of its being easily passed over. We cannot adopt the name *Tilo* given by De Candolle, that being employed by Rheede in a generic sense for several of the Balsams.

454. (13) I. *rufescens* (Benth.:) stems erect, branched, jointed, glabrous; leaves shortly-petioled, from elliptic and slightly cordate to obovate, sharply serrated; upper side hispid with short callous hairs; under glabrous and whitish, except the nerves which are hairy: pedicels solitary or in pairs, about the length of the leaves, villous: posterior sepals much smaller than the petals; anterior saccate, without a spur: anterior lobes of the petals oblong, protruded, much larger than the short roundish posterior one: capsule oval, glabrous.—*Benth.! in Wall.! L. n.* 4747; *Wight! cat. n.* 448, 453.

The habit expressed by the figures in Rheede, Mal. 9. t. 50, 51, is so much that of the present species, that we had doubts if we ought not to have adopted the specific name *minor*, given with the character derived from these figures by De Candolle: but Rheede's description agrees so well with his figures of the spur, that we are now rather inclined to refer both to our *I. Kleinii*.

455. (14) I. *fasciculata* (Lam.:) stems erect, glabrous: leaves opposite, almost sessile, from narrow-linear to lanceolate, usually rounded or cordate at the base, serrated; upper side somewhat hispid; under glabrous, whitish, and marked with coloured nerves: pedicels usually in pairs, slender, elongated, sometimes nearly as long as the leaves: sepals all with a callous point; lateral ones linear, falcate; posterior roundish-ovate, larger than the posterior but only half the size of the large anterior semi-obovate lobes of the petals; lower widely-infundibuliform, with a tapering slender spur about as long as the pedicel: stigmas combined: capsule oblong, a little ventricose, tapering at both ends.—*Spr. syst.* 1. *p.* 807; *Wight! cat. n.* 452.—I. fasciculata, *a. Lam. Enc. Meth.* 1. *p.* 359.—I. heterophylla, *Wall.! in Roxb. fl. Ind.* (*ed. Wall.*) 2. *p.* 458; *L. n.* 4748. *a.*—I. oppositifolia, *Rottl.! in herb. Sm.*—Balsa-

Digitized by Google

mina fasciculata, *DC. prod.* 1. *p.* 686.—B. heterophylla, *G. Don in Mill. dict.* 1. *p.* 749.—*Rheed. Mal.* 9. *t.* 47.

The leaves vary much even on the same specimen; but usually in those from the Peninsula they are broader and shorter than in the specimens from Silhet; with the latter, however, Rottler's agree.

456. (15) I. *diversifolia* (Wall.:) diffuse, rooting at the joints: leaves opposite, from narrow linear to ovate, somewhat cordate at the base, acutely dentate-serrated, glabrous on both sides: pedicels solitary or several together, longer than the leaves, filiform: lateral sepals linear-lanceolate, half the length of the corolla; anterior ovate, acuminated, with a filiform spur nearly as long as the flower; posterior scarcely exceeding the staminal column, larger than the small posterior lobes of the petals, much smaller than the large semi-obovate anterior ones: stigmas distinct: capsule oblong, glabrous.—*Wall.! L. n.* 4749; *Wight! cat. n.* 457.—I. Malabarica, *Klein!*—I. heterophylla, *Wall.! L. n.* 4748. *b.*

457. (16) I. *tomentosa* (Heyne:) stems diffuse, glabrous: leaves opposite, sessile, linear-lanceolate, obtuse, acutely serrated; upper side slightly hispid; under pale, glabrous: pedicels axillary, solitary or in pairs, pubescent, about as long as the leaves, in fruit deflexed: anterior sepal cucullate, with the spur short and inflated at the point: stigmas united: capsule oblong, tapering at both ends.—*Heyne! in Wall! L. n.* 4751; *Wight! cat. n.* 440.—I. reticulata, *Wall.! L. n.* 4750.—I. fasciculata, *Klein! in herb. Wight.*

Readily distinguished from *I. fasciculata*, to which it is closely allied, by the form of the spur: in this short with a swollen tip, in that long and tapering.

458. (17) I. *oppositifolia* (Linn.:) branches diffuse, filiform, flaccid: leaves opposite, from narrow linear-lanceolate at the top of the stem to broad obovate-lanceolate near the base, acute, membranaceous, slightly serrated, serratures bristly: pedicels axillary, solitary or in pairs, not half the length of the leaves, very slender: lower sepal cucullate, with a very short conical nearly straight spur: anterior lobe of the petals elongated, tapering much towards the base: stigmas united: capsule glabrous, narrow, tapering at both ends, with about 2 seeds towards the middle and a constriction between them.—*Linn.! in herb. Herm.!; Spr. syst.* 1. *p.* 808; *Wight! cat. n.* 443.—I. mysorensis, *Wall.! L. n.* 4743. *a.*—Balsamina oppositifolia, *DC. prod.* 1. *p.* 686.

A most distinct species, marked by its exceedingly membranaceous delicate appearance, its flowers large in proportion to the plant, the almost unguiculate lobe of the petals, and by the form of the capsules. We exclude the synonym of Rheede (Mal. 9. t. 31.), quoted by Linnæus and most botanists, because it appears to us to belong to *Scrophularineæ*, and is perhaps a species of *Bonnaya*. *I. rosmarinifolia*, Retz, according to Bertolone's description, (Roem. & Sch. Syst. 5. p. 348), approaches very closely, but seems to differ by the leaves "green above and glaucous beneath," and apparently not membranaceous.

459. (18) I. *inconspicua* (Benth.:) branched, diffuse, glabrous: leaves opposite, nearly sessile, from oval to linear-lanceolate, slightly cordate at the base, remotely and slightly bristle-serrated; under side pale, glaucous: pedicels solitary or several together, shorter than the leaves, pubescent: lateral sepals nearly equal to the flowers, linear; lower one gibbous without a spur: capsule oval, glabrous, few-seeded.—*Benth.! in Wall.! L. n.* 4741.—I. pusilla, *Heyne! in Wall.! L. n.* 4745.

These two synonyms appear at first sight to belong to very distinct species; but a more careful examination suggests that *I. inconspicua* is a luxuriant, the *I. pusilla* a starved, form of the same plant: at least we can perceive no important mark by which to separate them.

Digitized by Google

460. (19) I. *Kleinii* (W. & A.:) erect, with spreading diffuse branches: leaves opposite, from obovate and obtuse to lanceolate and acute, with a large gland on each side near the petiole; upper side hairy on the veins and near the margin; under glaucous: pedicels solitary or in pairs, filiform, longer than the obovate leaves, shorter than the lanceolate ones, in fruit reflexed: lateral sepals linear, equal to the column; posterior one hairy, concave, larger than the posterior lobe of the petals, much smaller than the elongated obovate anterior lobe; lower one with slender spur, nearly twice the length of the flower: capsule narrow-oblong, tapering at both ends, few-seeded.—*Wight! cat. n.* 442.—I. fasciculata, *Klein! in Wall. L.*—I. tenella, *Wall.! L. n.* 4746. *b.*—Balsamina minor, *DC.? prod.* 1. *p.* 686.—*Rheed. Mal.* 9. *t.* 50?, 51.

We feel tolerably certain that Rheede's t. 51. belongs to this: the descriptions of the stems, "slender, terete, transparent, shining, jointed, throwing out shoots from the joints," and of the spur, "curved from the pedicel up to between the two petals," and his figure of the latter, are sufficiently characteristic: we have more doubts about t. 50. Both figures represent the plant more robust, and every way larger than our specimen.

461. (20) I. *tenella* (Heyne:) erect: leaves opposite, lanceolate, shortly-petioled, sometimes slightly cordate, remotely bristle-serrated; under side glaucous; upper in the younger ones hairy: pedicels solitary or in pairs, sometimes longer than the leaves, pubescent on one side, horizontal but not reflexed in fruit: flowers small, longer than the straightish conical spur: capsules oval, pointed, few-seeded.—*Heyne! in Wall.! L. n.* 4746. *a.*

This is at once known from the allied *I. Kleinii*, by the short straight conical spur, and by the horizontal, not reflexed, fructiferous pedicels.

462. (21) I. *filiformis* (W. & A.:) slender, erect, with numerous spreading branches: leaves opposite, distant below, approximated towards the top of the branches, linear-lanceolate, glabrous on both sides: pedicels solitary in the axils of the two or three uppermost leaves, shorter than the leaves: flowers minute: lower sepal saccate without a spur: capsule glabrous, ovate, pointed at both ends: seeds few, oval, shining-black.—I. mysorensis, *Wall.! L. n.* 4743. *b.*

This is distinguished from *I. tenella* by the want of the spur: there is besides a considerable difference in the habit of the two plants. *I. rosmarinifolia* of Retz and Bertolone differs by having a short conical spur with a curved point, and by the lower leaves broad and short, while the upper ones are long and narrow.

II. HYDROCERA. *Blume.*—Tytonia, *G. Don.*

Sepals 5, distinct, coloured. Petals 5, unequal, distinct; the upper one arched. Stamens 5: filaments connate at the apex: anthers slightly connate, 2-celled, opening at the apex. Stigmas 5, sessile, acute. Fruit succulent, drupaceous, 5-angled, 5-furrowed, 5-celled; endocarp hard and bony. Seeds solitary.—Herbaceous water-plants with angular stems. Leaves alternate, serrated, exstipulate. Peduncles axillary.

"The type of this genus and of the order Hydrocereæ is *Impatiens natans*, Willd.; a circumstance apparently unknown to botanists and even to Blume himself." ARN. We have, therefore, reduced the order to Balsamineæ. When De Candolle suggested that *I. natans* and *I. madagascariensis* might together form a genus, we suspect he had not seen the fruit of either, otherwise he would have proposed a much better character than the one (the gibbous spurs) he recommends, which applies to several true species of *Impatiens*, as *I. scabriuscula*, *I. pendula*, *I. rufescens*, and *I. oppositifolia*. We are not aware that the fruit of *I. madagascariensis* has since been seen, and until it be known, we prefer leaving that species in *Impatiens*, with which its other characters better accord.

463. (1) H. *triflora* (W. & A.:) leaves from linear to broad-lanceolate, serrated, glabrous on both sides, under side glaucous: peduncles short,

Digitized by Google

axillary, solitary, 2–4- but usually 3-flowered: pedicels slender, longer than the peduncles: lateral sepals as long as the others; anterior one concave, gibbous at the base, with a short curved spur tumid at the point: anterior petals somewhat 3-lobed, with the margins involute near the base.—*Wight! cat. n.* 445.—Impatiens triflora, *Linn.! in herb. Herm.!; Willd.; DC. prod.* 1. *p.* 687; *Spr. syst.* 1. *p.* 808; *Roth. nov. sp. p.* 164; *Wall.! L. n.* 4756.—I. natans, *Willd. sp.* 1. *p.* 1175; *DC. prod.* 1. *p.* 687; *Spr. syst.* 1. *p.* 808; *Roxb. fl. Ind.* 1. *p.* 652; (*ed. Wall.*) 2. *p.* 455; *Wall.! L. n.* 4755.—I. baccifera, *Roxb. in E. I. C. mus. t.* 440; *herb. Heyne.—Burm. Zeyl. t.* 16. *f.* 2.——Not unfrequent in ditches and tanks in the Tanjore country, flowering during the autumn.

We have given a specific character, lest the species from Java, *H. angustifolia*, Bl., be distinct. *I. triflora* of Linnæus has been long involved in doubt: we have, however, examined the original specimen in Hermann's herbarium, in which also is an excellent drawing, exhibiting the sepals and petals all distinct as we have described them: the spur, notwithstanding Burmann's inaccurate figure and description, is quite as in our plant.

ORDER XLIV.—OXALIDEÆ. *DC.*

Sepals 5, equal, sometimes cohering at the base, persistent: æstivation imbricative. Petals 5, hypogynous, equal, unguiculate: æstivation twisted. Stamens 10, hypogynous, more or less monadelphous; those opposite the petals longer than the others: anthers erect, bilocular. Ovarium 5-angled, 5-celled: ovules solitary or several in each cell: styles 5, filiform: stigmas capitate, or slightly bifid. Placentæ in the axis. Fruit rarely baccate; usually capsular, membranous, 5-celled, and 5–10-valved. Seeds 1 or several in each cell: testa fleshy, bursting elastically. Albumen between cartilaginous and fleshy. Embryo straight, as long as the albumen: radicle long, next the hilum: cotyledons foliaceous.—Leaves compound (or by abortion simple), alternate, seldom opposite or whorled.

I. AVERHOA. *Linn.; Lam. ill. t.* 385.

Sepals more or less united at the base. Petals 5. Stamens 5 (alternate with the petals), or 10 (the alternate ones smaller), combined at the base into a short annulus. Ovary angled. Styles 5, persistent. Berry large, oblong, 5-furrowed, 5-celled. Seeds few in each cell, attached to the central angle.—Trees. Leaves alternate, in *A. Bilimbi* irritable to the touch, unequally pinnated; leaflets entire. Flowers racemosely panicled. Fruit edible.

464. (1) A. *Carambola* (Linn.:) leaflets ovate, acuminated, 2–5 pair: calyx glabrous: limb of the petals roundish: stamens 5: fruit acutely angled: seeds arillate.—*DC. prod.* 1. *p.* 689; *Spr. syst.* 2. *p.* 440; *Roxb. fl. Ind.* 2. *p.* 450; *in E. I. C. mus. t.* 944; *Wall.! L. n.* 4345; *Wight! cat. n.* 458.—*Rheed. Mal.* 3. *t.* 43, 44; *Rumph. Amb.* 1. *t.* 35.

"The Sanskrita name is *Karma-ranga*, in the vulgar dialects of the north corrupted into *Kama-ranga*, a name which extends from the Ganges even to Ceylon; and I suspect that even the *Tamaratonga*, which Rheede says is the vulgar name in Malabar, is a mere corruption, by errors in copiers and printers, of the same word. As for *Carambola*, it is, I suspect, one of those productions of careless travellers, which are considered as Indian words by

Digitized by Google

Europeans, and as European words by the Indians."—HAM. *in Wern. Soc. Tr. 5. p.* 334.

465. (2) *A. Bilimbi* (Linn.:) leaflets oblong-lanceolate, acuminated, 5–10 pair: calyx pubescent: limb of the petals ovate-oblong: stamens 10: fruit obtusely angled: seeds exarillate.—*DC. prod.* 1. *p.* 689; *Spr. syst.* 2. *p.* 440; *Roxb. fl. Ind.* 2. *p.* 451; *Wall.! L. n.* 4346; *Wight! cat. n.* 975.—*Rheed. Mal.* 3. *t.* 45, 46; *Rumph. Amb.* 1. *t.* 36.

II. OXALIS. *Linn.; Lam. ill. t.* 391; *Gærtn. fr. t.* 113.

Sepals 5, distinct or combined at the base. Petals 5. Stamens 10: filaments distinct or shortly connected at the base, the 5 alternate ones shorter. Styles 5, usually crowned with pencil-like, rarely capitate or bifid, stigmas. Capsule 5-angled, globose, ovate, oblong, or cylindrical; cells with 1 or several seeds.—Caulescent, stipitate or stemless herbaceous plants, usually perennial, rarely annual. Leaves various.

We omit here *O. caprina*, Linn.? (Wight! cat. n. 459), the specimens having been obtained at Longwood in St Helena.

§ 1. *Annual or suffruticose with a naked stem, bearing at the apex an umbel or corymb of abruptly pinnated leaves: leaflets numerous, opposite: peduncles* 1-, *or umbellately many-flowered.*—Biophytum, *DC.*

466. (1) O. *sensitiva* (Linn.:) stem scarcely any: leaves umbellate, irritable to the touch: leaflets 10–14 pairs, obliquely obovate or oblong, obliquely truncate at both base and apex, mucronulate; upper side glabrous or slightly hairy, nearly veinless; under glaucous, glabrous, with a prominent midrib and diverging veins: peduncles from among the leaves, usually several together, pubescent, from half as long to twice as long as the leaves, incrassated at the apex: flowers numerous, umbellate; pedicels intermixed with numerous bracteas at their base: sepals lanceolate-subulate, with numerous longitudinal striæ: filaments distinct: pistils shorter than the stamens: cells of the ovary about 4-ovuled.—*Spr. syst.* 2. *p.* 432: *Roxb. fl. Ind.* 2. *p.* 457; *in E. I. C. mus. t.* 1244: *Wight! cat. n.* 461, 462.—Biophytum sensitivum, *DC. prod.* 1. *p.* 690; *Wall.! L. n.* 4347.—*Rheed. Mal.* 9. *t.* 19; *Rumph. Amb.* 5. *t.* 104. *f.* 2.

§ 2. *Caulescent, stipitate or stemless herbaceous plants: leaves pinnately* 1–3-*foliolate, or palmately* 3–13-*foliolate, rarely bifoliolate: peduncles* 1–2- *or many-flowered.*—Oxalis, *DC.*

467. (2) O. *corniculata* (Linn.:) stems decumbent, branched, radicating, leafy: stipules united to the base of the petiole: leaves palmately 3-foliolate; leaflets obcordate, pubescent: peduncles 2–5- but mostly 2-flowered: stamens monadelphous: sepals pubescent: petals emarginate: pistils as long as the longer stamina: capsule many-seeded, densely pubescent.—*DC. prod.* 1. *p.* 692; *Spr. syst.* 2. *p.* 429; *Roxb. fl. Ind.* 2. *p.* 457; *Wall.! L. n.* 4347; *Wight! cat. n.* 460.—O. monadelpha, *Roxb. in E. I. C. mus. t.* 1433.—O. pusilla, *Salisb.; Roxb. fl. Ind. p.* 457 (kept distinct by error of the press).

The Indian and Cape of Good Hope specimens have the peduncles longer than the leaves, the European ones shorter than them, but we can see no other difference. It differs from *O. stricta*, Sal. by the habit, and by the presence of stipules, which, however, in the warmer climates quickly shrivel up and disappear, unless the specimens be found in a shady situation. We cannot point out any distinguishing character between it and what we conceive to be *O. repens*, Thunb.

Digitized by Google

ORDER XLV.—CONNARACEÆ. *R. Brown.*

Flowers bi- (rarely uni-) sexual. Calyx 5-partite, regular, persistent: æstivation imbricate or valvular. Petals, 5, equal, inserted into the base of the calyx. Stamens twice as many as the petals, rarely with half of them sterile, hypogynous: filaments usually combined at their base into a glandular ring. Ovaria simple and solitary, or several and distinct: ovules in pairs, collateral, ascending: styles terminal, continuous with the central angle of the carpels: stigmas obtuse, usually dilated. Capsules 1–5, dehiscing longitudinally at the ventral suture. Seeds solitary, erect, sometimes with an arillus. Albumen none, or fleshy. Radicle superior, at the opposite extremity from the hilum: cotyledons thick when there is no albumen, foliaceous in those with it. —Trees or shrubs, without resinous juices. Leaves compound, alternate, not dotted, exstipulate.

The æstivation of the calyx, number of styles, presence or absence of albumen, are the points on which, following Dr Brown, we have formed our generic characters. We ought, however, to remark, that De Candolle considers the number of styles of less importance than the situation of the seed in the fruit (whether at the base or attached to the suture), the presence or absence of arillus, and the fruit being sessile or stalked. *Eurycoma* of Jack can scarcely belong to this order: it has 5 stamens with a couple of villous glands between each: the styles are united into one which is short and has 5 recurved stigmas; the ovules also are solitary: whence we are rather disposed to place it among the Ailantheæ.

I. CONNARUS. *Linn.; Lam. ill. t.* 572.—Omphalobium, *Gærtn. fr. t.* 46.

Calyx 5-partite: æstivation imbricate. Petals 5. Stamens 10, united at the base. Ovary solitary. Style 1. Capsule pod-shaped, solitary. Seed 1, without albumen.

To this genus belongs *Omphalobium*, § *Connaroidea* of De Candolle.

468. (1) C. *monocarpus* (Linn.:) leaves 3–5-foliolate; leaflets ovate, obtusely acuminated, coriaceous, glabrous, shining above: panicles fascicled, axillary and terminal; branches and calyx glabrous: sepals oblong: fruit sessile: seed attached to the base of the cell, with a complete fleshy arillus.—*DC. prod.* 2. *p.* 85; *Wight! cat. n.* 537, 538.—C. asiaticus, *Willd. sp.* 3. *p.* 692; *Spr. syst.* 3. *p.* 78.—Rhus Rædælijavel, *Mill.*—*Rheed. Mal.* 7. *t.* 26; *Burm. Zeyl. t.* 89.——Travancore.

We have no doubt about the above synonyms, although Burmann represents the leaves less acuminated than we have seen them: on the other hand, we have not seen either leaves or fruit so large as in Rheede's figure, although in other respects it be pretty good.

469. (2) C. *pinnatus* (Lam.:) leaves 3–5-foliolate; leaflets oval-oblong, acuminated, glabrous, shining on both sides, coriaceous: panicles terminal, elongated; branches and calyx pubescent: sepals oblong: ovary hairy: fruit stalked: seed attached to the suture, a little above the base, with an imperfect arillus.—*Lam. in Encycl. Meth.* 2. *p.* 95; *ill. t.* 572; *Spr. syst.* 3. *p.* 78; *Wight! cat. n.* 540.—Omphalobium pinnatum, *DC. prod.* 2. *p.* 86; O. Indicum, *Gærtn. fr.* 1. *t.* 46; *DC. prod.* 2. *p.* 85.—*Rheed. Mal.* 6. *t.* 24.

II. ROUREA. *Aubl.*—Cnestis, *Jack.* (not *Juss.*)

Calyx 5-partite; æstivation imbricate. Petals 5. Stamens 10, united at

Digitized by Google

the base. Ovaries 5, several of them usually becoming abortive. Styles 5. Capsules glabrous, pod-shaped, usually solitary from abortion. Seed solitary, usually (always?) with a complete or incomplete arillus: albumen none.

To this belongs *Omphalobium*, § *Cnestoidea* of De Candolle, *Cnestis monadelpha*, Roxb., *C. emarginata*, *florida*, and *memosoides* of Jack, *Connarus Roxburghii*, Hook. and Arn. (in Bot. Beech. Voy. p. 179), and *Conn. microphyllus*, Hook. and Arn. (l. c.) It was at one time supposed that *C. Roxburghii*, H. & A., had been found in the Peninsula; but although extremely similar to the Chinese plant, Dr Wight's specimens have now been ascertained to be *Conn. monocarpus*.—*Robergia hirsuta* of Roxburgh appears to be a true *Cnestis*.

* 470. (1) R. *santaloides* (W. & A.:) glabrous: leaflets 2–4-pair, ovate with a narrow blunt acumination, thin-coriaceous, shining, veins prominent: panicles narrow, axillary and terminal, few-flowered: sepals ovate, glabrous: ovaries glabrous: capsule solitary.—*Wight! cat. n.* 539.—Connarus santaloides, *Vahl, symb.* 3. *p.* 87; *DC. prod.* 2. *p.* 85; *Spr. syst.* 3. *p.* 78.

Our specimens are from Rottler's herbarium, from Columbo in Ceylon, and were named by Vahl to the missionaries *Conn. santaloides*, so that we are enabled to determine Vahl's mistake when he says "stylus unicus." We have not seen the fruit, but according to Vahl it is solitary.

ORDER XLVI.—ZYGOPHYLLEÆ. *R Brown.*

Flowers bisexual, regular. Calyx 4–5-divided. Petals unguiculate, alternate with the sepals: æstivation usually convolute. Stamens twice as many as the petals, hypogynous: filaments distinct, dilated at the base, and usually arising each from the back of a scale: anthers 2-celled, opening longitudinally. Ovarium simple, more or less 4–5-furrowed, 4–5-celled: ovules in pairs or more, pendulous, or rarely erect: style simple, often 4–5-furrowed: stigma simple, or 4–5-lobed. Fruit capsular, or rarely fleshy, with 4–5-angles or wings, 4–5-valved and loculicidal, or indehiscent: endocarp and sarcocarp combined. Seeds usually fewer than the ovules. Albumen between fleshy and horny, rarely 0. Embryo green: radicle superior: cotyledons foliaceous.—Leaves opposite, stipuled, not dotted, rarely simple.

We pass over *Zygophyllum fabago*, Linn. (Wight! cat. n. 464), it being from Persia. We think it also unnecessary to insert here *Melianthus major*, Linn. (Wight! cat. n. 463), as the specimens must have been cultivated: moreover, it does not seem to belong to this order.

I. TRIBULUS. *Linn.; Lam. ill. t.* 346; *Gærtn. fr. t.* 69.

Calyx deeply 5-partite, usually permanent. Petals 5, longer than the calyx. Stamens 10, filaments naked, the five opposite to the sepals with a gland externally at the base. Ovary hairy, usually girt at the base by a 10-toothed urceolus or 5 scales opposite to the sepals, 5-celled: ovules 3–4 in each cell, superposed, pendulous. Style short or scarcely any. Stigma large, broader than the style, 5-ribbed. Fruit 5-coccous; cocci remaining long connected together, at length separating, indehiscent, externally tuberculate or prickly, internally divided obliquely by transverse septa into 2–4-superposed 1-seeded cells. Seeds without albumen: embryo straight.—Diffuse, trailing, herbaceous plants. Leaves opposite, 2-stipuled, abruptly

Digitized by Google

pinnate. Peduncles 1-flowered, solitary, alternate, axillary. Flowers yellow or white.

Kallstrœmia, Scop. (containing *Trib. maximus*, Lin. and *Ehrenbergia tribuloides*, Mart.) differs slightly by the 5-celled ovary, each cell containing two collateral pendulous ovules, and spuriously divided into two by a longitudinal septum (representing a 10-celled 10-ovuled ovary); by the 10-ribbed stigma; and by the fruit splitting into 10 1-seeded cocci, without transverse partitions.

471. (1) T. *lanuginosus* (Linn.:) leaflets 5–6-pair, nearly equal, with a close-pressed villous pubescence: peduncles shorter than the leaf: cocci each with 2 prickles.—*DC. prod.* 1. *p.* 704; *Spr. syst.* 2. *p.* 325: *Wall.! L. n.* 6854; *Wight! cat. n.* 467.—*Burm. Zeyl. p.* 106. *f.* 1.

II. FAGONIA. *Linn.; Lam. ill. f.* 346; *Gærtn. fr. t.* 113.

Calyx deeply 5-partite, deciduous. Petals 5, longer than the calyx. Stamens 10; filaments naked at the base. Ovary acutely 5-angled, 5-celled: ovules 2 in each cell, pendulous from podosperms ascending from near the base of the cell. Style continuous with the top of the ovary, 5-angled, permanent. Stigma acute, 5-furrowed. Fruit capsular, 5-coccous; cocci compressed, at length separating from the central persistent axis, 2-valved, 1-seeded. Seeds ovate, compressed, scabrous, erect from the base of the axis. Embryo straight in a thin cartilaginous albumen.—Suffrutescent plants with spreading branches. Leaves opposite, 2-stipuled (stipules often thorny), 1–3-foliolate; leaflets mucronate. Peduncles from between the stipules of the opposite leaves, solitary, 1-flowered. Flowers purplish, violet, or yellowish.

472. (1) F. *Mysorensis* (Roth.:) branches terete, striated: leaves 1-foliolate: leaflet linear, cuspidate: stipules spinous, subulate, very sharp and acerose, longer than the leaf: peduncles twice as short as the leaf: fruit pubescent.—*Roth. nov. sp. p.* 215; *DC. prod.* 1. *p.* 704; *Wall. L. n.* 6853; *Wight! cat. n.* 465.——Southern provinces in elevated situations.

ORDER XLVII.—RUTACEÆ. *Juss.*

Flowers bisexual, regular. Calyx 4–5-divided. Petals alternate with the sepals: æstivation between twisted and convolute, rarely valvular. Stamens twice or rarely thrice as many as the petals, inserted round the base of the torus: anthers 2-celled, opening longitudinally. Torus various, discoid, or elevated, or cup-shaped. Ovary usually more or less deeply 3–5-partite, 3–5-celled: ovules in each cell 2–4, or 6–12, or numerous, pendulous or partly pendulous, or adnate to the placentas: styles combined, or in the deeply lobed ovaries distinct at the base and combined upwards: stigma 3–5-angled or furrowed. Capsule usually 4–5-lobed, the lobes opening internally at the apex: rarely 3-valved and loculicide, or a 4-celled drupe: sarcocarp and endocarp combined. Seeds by abortion often fewer than the ovules, pendulous or adnate. Embryo contained in the fleshy albumen: radicle superior: cotyledons flat.—Leaves exstipulate (except in *Peganum*), alternate (except in *Cyminosma*), simple, or deeply lobed, or rarely pinnated, usually with pellucid dots.

Digitized by Google

I. PEGANUM. *Linn.; Gærtn. fr. t.* 95; *Lam. ill. t.* 401.

Calyx 5-parted, segments foliaceous, oblong-linear, entire or pinnatifid, persistent. Petals 5, nearly equal, entire, 3-nerved. Stamens 15 (some of them abortive), shorter than the petals: filaments dilated and membranaceous at the base: anthers linear-oblong. Torus short, beneath expanded into a short thick cup-shaped disk, bearing the petals and stamens on the outer margin. Ovary seated on the torus or gynophore, globose, 3-lobed, 3-celled: ovules numerous in each cell, suspended. Style simple, erect, clavate and 3-angled at the apex, at length spirally twisted. Fruit slightly stalked, capsular, globose, 3-furrowed, 3-valved, loculicidal. Seeds fewer than the ovules, scrobiculate. Albumen closely adhering to the integument of the seed.—Perennial, branched, herbaceous plants. Leaves alternate, simple or multifid, with linear segments, not dotted, with two short bristle-shaped teeth (stipules) at the base. Flowers white.

473. (1) P. *Harmala* (Linn.)—*DC. prod.* 1. *p.* 712; *Spr. syst.* 2. *p.* 452; *Wight! cat. n.* 466.

II. RUTA. *Linn.; Gærtn. fr. t.* 111; *Lam. ill. t.* 345.

Calyx 4-partite, at length deciduous. Petals 4, longer than the calyx, unguiculate: the limb vaulted, usually waved or jagged. Stamens 8, longer than the petals: filaments subulate-filiform, glabrous: anthers ovate, obtuse. Torus or gynophore usually broader than the ovary, marked round about with 8 nectariferous pores, bearing the petals and stamens at the base. Carpels 4, partly combined by means of the central axis into one 4-lobed ovary: ovules 6–12 (or rarely 2 collateral), in each cell. Styles 4, distinct at the base where they spring from the inner angle of the carpels above the common axis, united upwards into a single pistillum, which is attenuated towards the apex. Stigma 4-furrowed, not thicker than the style. Capsules 4, partly united, dehiscing internally at the apex. Seeds dotted.—Perennial or suffrutescent herbaceous plants. Leaves alternate, exstipulate, pinnated, or decompound, with pellucid dots. Flowers yellow or rarely white, disposed in terminal corymbs or racemes: the number of parts occasionally augmented by a fourth.

474. (1) R. *angustifolia* (Pers.:) leaves glaucous, supra-decompound, four times longer than broad; lobes cuneate-oblong, nearly of a size: bracteas small, ovate: petals ciliated.—*DC. prod.* 1. *p.* 710; *Spr. syst.* 2. *p.* 320; *Wight! cat. n.* 977.—R. Chalepensis β, *Linn. Mant. p.* 69; *Wall. L. n.* 7113. —R. graveolens α, *Linn. sp. p.* 548.

III. CYMINOSMA. *Gærtn. fr.* 1. *p.* 58.

Calyx short, deeply 4-lobed. Petals 4, much longer than the calyx, narrow, revolute at the apex. Stamens 8, longer than the petals: filaments flat, subulate, with woolly margins near the base: anthers ovate. Torus forming a gynophore slightly broader than the ovary, and nearly continuous with it, tomentose. Ovary seated on the torus, fleshy, tomentose, 4-celled: ovules 2 in each cell, superposed. Style terminal, short, glabrous, ending in a 4-sulcated stigma. Fruit drupaceous: sarcocarp, thick, fleshy, closely attached to the nut; nut thick, hard, bony, 4-celled. Seeds solitary in each cell.—Trees or shrubs. Leaves opposite, between lanceolate and elliptical, simple, entire,

Digitized by Google

with minute pellucid dots. Peduncles axillary near the ends of the branches, and terminal, regularly divided into corymbs. Flowers yellowish-green.

After a careful examination, we are inclined to differ from Jussieu about the structure of the torus: we do not find it inclosing the whole ovary as he represents, but only reaching as high up as the base of the cells, and forming there a margin or shoulder round the ovary, although this be seen with difficulty on account of the tomentum which covers both torus and ovarium: the structures can be best observed in a thin longitudinal slice. Jussieu had not seen the fruit. Gærtner says it is a berry, but his description applies better to that of a drupe: we find a very hard nut, although it does not of itself separate from the fleshy exterior.

475. (1) C. *pedunculata* (DC.)—*DC. prod.* 1. *p.* 722; *Wall.! L. n.* 1205; *Wight! cat. n.* 307, 308, 309, 468.—C. Ankœnda, *Gærtn. fr.* 1. *p.* 280 (descr. bad); *DC. prod.* 1. *p.* 722.—Jambolifera pedunculata, *Vahl, symb.* 3. *p.* 52. *t.* 61; *Spr. syst.* 2. *p.* 216.—Gela lanceolata, *Lour.*—Selas lanceolatum, *Spr. syst.* 2. *p.* 216.—Ximenia? lanceolata, *DC. prod.* 1. *p.* 533.—*Rheed. Mal.* 5. *t.* 4, 15.

A widely distributed plant: we have specimens before us from China, and also from the Mauritius. Gærtner has, in his *C. Ankœnda*, obviously mistaken the parts of the flower, and the specimens before us show that no dependence is to be placed on the shape of the fruit, so that we do not hesitate to unite it to the Linnean plant. As to *Jambolifera pedunculata* of Loureiro, he does not notice the number of stamens, but the fruit is described as umbilicated (or inferior) and 1-seeded; and the figure quoted (Rumph. Amb. 1. t. 42) shows it to be *Syzygium Jambolana*. The two other species described by Loureiro under *Jambolifera* do not appear to be referable to *Cyminosma*, nor even to belong the two to the same genus.

ORDER XLVIII.—ZANTHOXYLACEÆ. *Arn.*

Sub.-Ord. 1. ZANTHOXYLEÆ (*Ad. de Juss.*) Flowers by abortion unisexual, regular. Calyx 3–4–5-divided. Petals equal in number (rarely more) to the sepals: æstivation usually twisted-convolute. Stamens as many, or twice as many, as the petals, inserted round the base of the torus. Torus elevated and forming a gynophore or short thick stalk to the pistillum, which, in the male flowers, is rudimentary or rarely entirely absent. Carpels usually as many as the petals, sometimes fewer, seated on the gynophore, sometimes combined into one ovary, sometimes entirely or partially distinct: ovules 2, or rarely 4, in each carpel: styles in the single ovaries combined, in the distinct ovaries either distinct or combined upwards, sometimes none: stigma 2–5-lobed in the united styles, simple in the distinct styles. Fruit sometimes single, baccate or membranaceous, 2–5-celled; sometimes of 1–5 distinct drupes or 2-valved capsules, of which the sarcocarp is either entirely combined with, or only partially separable from, the endocarp. Seeds solitary or in pairs, pendulous. Embryo lying within a fleshy albumen: radicle superior: cotyledons oval, flat.—Leaves exstipulate, alternate or opposite, with pellucid dots or rarely without them.

I. ZANTHOXYLON. *Linn.*

Dicœcious. Calyx short, 3–4–5-partite. Petals as many and longer than the sepals, very rarely wanting.—MALE. Stamens as many as the petals,

Digitized by Google

equal to or longer than them, inserted round the base of the gynophore. Pistillum rudimentary, simple or compound.—Fem. Stamens usually wanting, sometimes very short, and either with or without abortive anthers. Ovaries (1–5) as many as the petals or fewer, seated on a globose or cylindrical gynophore: ovules 2 in each cell, suspended, collateral. Styles 1 from the apex of each ovary, either distinct or united at the apex, sometimes very short or scarcely any. Capsules 1–5, sessile or stalked on the gynophore, 2-valved, 1–2-seeded. Seeds when solitary globose, when in pairs hemispherical, shining and black. Embryo straight or slightly curved.—Trees or shrubs, with usually prickles on the branches, petioles, and nerves of the leaves. Leaves usually pellucid-dotted, alternate or opposite, simple, ternate, or pinnated either with or without an odd one. Flowers small, inflorescence axillary or terminal, various.

476. (1) Z. *Rhetsa* (DC.:) arboreous, with prickles over every part of the tree; bark corky: leaves alternate, equally pinnated; leaflets 8–16-pair, lanceolate, unequal-sided, quite entire, glabrous, panicles terminal: petals and stamens 4: ovary and style solitary: stigma acute: capsule sessile, solitary, globose: seed solitary.—*DC. prod.* 1. *p.* 728.—Fagara Rhetsa, *Roxb. fl. Ind.* 1. *p.* 417; *(ed. Wall.* 1. *p.* 438; *in E. I. C. mus. tab.* 185*).—Rheed. Mal.* 5. *t.* 34.——Mountainous parts of the coast of Coromandel.

We have not seen this: nor do we know whether *Lacuris illicioides*, Ham. in Wall. L. n. 7119, be the same or not. It, *Z. Bardumga*, DC., and some species from America, agree in being tetrandrous with a single ovary: thus approaching on the one hand to the subgenus *Fagara*, Jacq.* (tetrandrous with two ovaries), and on the other to *Macqueria* or *Langsdorfia* (pentandrous with one ovary): the subgenus which they form may be called *Rhetsa*. *Z. Zelanicum*, DC. (the *Lunu-Ankænda*, Gærtn. fr. t. 68, f. 9, and consequently the *Fagara triphylla* of Moon's Catalogue of Ceylon plants and of Roxburgh, *Evodia triphylla*, DC., and *Zanthox. triphyllum*, Juss.), does not, however, belong to it, but to the subgenus *Aubertia*, the pistillum being 4-celled, although the number of mature capsules be, from abortion, often reduced to one or two: we believe that it has not been yet found in the Peninsula, but if so, it may be readily recognised by being without prickles, and by the leaves being tri-foliolate, opposite and glabrous.

477. (2) Z. ? *connaroides* (W. & A.:) unarmed: leaves alternate, unequally pinnated; leaflets 3–4-pair; lateral ones ovate, unequal-sided; terminal one oblong; all with a short obtuse acumination, quite entire, without pellucid dots, glabrous above, pubescent and slightly glaucous beneath: petioles glabrous: peduncles glabrous, axillary, elongated, bearing a dichotomous cyme with the primary ramifications elongated: calyx 5-cleft: capsule coriaceous, solitary, sessile, gibbous at the base, ovoid, glabrous: seed solitary.—*Wight! cat. n.* 553.

Capsule 2-valved, valves when dry diverging widely on the one side, but cohering together half-way up on the other; endocarp partly separating from the sarcocarp: the seed is about the size of a large cherry-stone, is suspended from near the summit of the one side of the capsule, and is externally crustaceous and only slightly glossy; the whole coat is very thin: there is no arillus. We have not seen the flower, but while the leaves are more like *Connarus*, the above structure of the fruit seems to bring it to the present order, if not to *Zanthoxylum*. The only specimen before us has no prickles either on the leaves or peduncle.

478. (3) Z. *tetraspermum* (W. & A.:) shrubby, very prickly; young shoots

* From this *Fagara*, Lam., is different, having 3 petals, 3 stamens, and 3 ovaries; Desvaux has called it *Tobinia*.

Digitized by Google

pubescent, older ones glabrous: petioles glabrous, prickly: leaves alternate, pinnate; leaflets few, glabrous, oblong with a short obtuse acumination, with distant blunt serratures; racemes compound, axillary and terminal, almost without prickles, pubescent: petals, stamens, and ovaries, 4: capsules 4, all usually ripening, each with 1 glossy black seed.—*Wight! cat. n.* 981 (male), 982 (fruit).—Zanthoxyli facie, &c., *Wall.! L. n.* 7526.

The alternate leaves and symmetrical flowers in a quaternary proportion will distinguish this from all the known species and even sections of the genus. Some of the leaves appear to us pinnately trifoliolate; others present a petiole on which there are the scars of 2 pair of leaflets, and there may also have been a terminal one; while, on the other hand, the terminal leaflet of the trifoliolate leaf is on the one side of the apex of the petiole, indicating that there may have been four leaflets. From the very imperfect materials we yet have, it is thus impossible to state either the number of the leaflets, or whether the leaves be equally or unequally pinnated.

II. TODDALIA. *Juss.*—Scopolia. *Lam. ill. t.* 139. *f.* 1.

Flowers unisexual. Calyx short, 4–5-toothed. Petals 4–5, longer than the calyx, spreading.—MALE. Stamens 4–5, longer than the petals, inserted round the base of the gynophore. Pistillum rudimentary, prism-shaped, 5-angled.—FEM. Filaments 5, sterile, very short. Gynophore short, 5-furrowed, gland-like. Ovary 1, ovoid, fleshy, 5- (or fewer?) celled: ovules 2 in each cell, superposed. Stigma nearly sessile, peltately 5-lobed. Fruit fleshy, dotted, 2?–5-celled (some of the cells occasionally abortive). Seed solitary in each cell, somewhat angled-reniform. Embryo curved.—Shrubs. Leaves alternate, digitately trifoliate, more or less pellucid-dotted, with sometimes two glands at the base of the leaflets. Flowers in axillary or terminal racemes or panicles.

479. (1) T. *aculeata* (Pers.) stem and branches prickly: leaflets sessile, from oblong to broad-lanceolate, crenulate, glabrous, closely pellucid-dotted; midrib beneath and petioles prickly or occasionally unarmed: racemes simple or compound: fruit 5-furrowed, with 3–5 perfect cells.—*DC. prod.* 2. *p.* 83; *Wight! cat. n.* 531, 532.—T. Asiatica, *Lam.*—T. nitida, *Lam. ill. t.* 139. *f.* 1. T. rubricaulis, *Willd.*—Scopolia aculeata, *Sm. ic. ined. p.* 34; *Spr. syst.* 1. *p.* 779; *Roxb. fl. Ind.* 1. *p.* 616; *(ed. Wall.)* 2. *p.* 374; *in E. I. C. mus. tab.* 191. —Paullinia Asiatica, *Linn.*—*Rheed. Mal.* 5. *t.* 41; *Burm. Zeyl. t.* 24.

To this, particularly to Wight's cat. n. 532 (petioles and leaves unarmed), the *T. floribunda*, Wall.! pl. As. rar. 3. t. 3, approaches so closely, that unless in the tubercles (or very large base to the prickles) on its stem, we can point out no character to separate them. All the prickly species we have seen from the Peninsula, Ceylon, or Mauritius, we refer without hesitation to one and the same species.

480. (2) T.? *bilocularis* (W. & A.:) upper part not prickly: leaflets equally stalked, elliptic-lanceolate, acuminated at both ends, with the point bluntish, glabrous, pellucid-dotted, quite entire; lateral veins numerous, parallel and uniting into one that is parallel to and close to the margin: panicles axillary and terminal: fruit globose and 2-celled.—*Wight! cat. n.* 533.

We can see no trace of thorns or prickles on our specimens: the fruit is very young, and contains only two cells; the dissepiment is thick and fleshy in the middle: there are no traces of abortive cells, nor even of seeds, in those we have examined. The dots on the younger leaves are pellucid, but on the older ones nearly opaque, from being filled with a resinous matter.

Digitized by Google

Sub-ord. 2. AILANTHEÆ (*Arn.*) **Flowers unisexual, regular. Calyx 4–5-divided. Petals 4–5, alternate with the sepals: æstivation between valvular and twisted. Stamens as many as the petals and alternating, or twice as many, about the same length: filaments inserted round the base of the torus, not arising from scales: anthers 2-celled, bursting longitudinally. Torus discoid, or 4-lobed and cupshaped. Ovaries several, distinct: ovules solitary in each cell, pendulous: styles very short, distinct, or slightly cohering at the origin of the stigmas: stigmas distinct, filiform, recurved, papillose. Carpels 3–5, distinct, indehiscent, drupaceous or samaroid, 1-celled, 1-seeded. Albumen? a thin fleshy plate, closely adhering to the integument of the seed, and resembling an inner coat. Embryo straight: radicle superior, short: cotyledons fleshy.—Trees or shrubs. Leaves alternate, exstipulate, equally or unequally pinnated, without pellucid dots.**

In *Ailanthus* the samara might almost be called a membranaceous drupe, the part around the seed being hard and nearly bony. This group includes *Brucea*, and perhaps *Eurycoma*, Jack.

III. AILANTHUS. *Desf.*

Polygamous. Calyx 5-cleft. Petals 5. Torus produced upwards into a 5-plaited waved annulus.—MALE. Stamens 10, and with the petals inserted on and around the base of the torus. Ovaries rudimentary, 5 or fewer, minute, distinct, inserted between the plaits of the torus.—FEM. Stamens partly abortive. Ovaries 3–7, distinct, compressed. Styles from a notch on the inner angle of the ovaries, distinct at the base, imperfectly united at the apex, bearing at the point of union about 5 (3–7) long stigmas. Samaræ several, usually from abortion fewer than the ovaries, oblong, compressed, membranaceous, reticulated, swollen and 1-celled in the middle. Seed compressed. Cotyledons semi-lenticular.—Tall trees. Flowers fascicled, in large branched terminal panicles.

481. (1) A. *excelsa* (Roxb.:) leaves abruptly pinnated, young ones tomentose, old ones glabrous; leaflets coarsely toothed at the base, with an inconspicuous gland beneath at the points of the teeth: petals almost glabrous within: filaments glabrous, shorter than the anthers: samaræ linear-oblong.—*Roxb. Cor.* 1. *p.* 24. *t.* 23; *fl. Ind.* 2. *p.* 450: *DC. prod.* 2. *p.* 89; *Spr. syst.* 1. *p.* 939; *Wight! cat. n.* 545.

From this *A. glandulosa*, Desf. differs by the petals being very woolly towards the base on the inside, and by the filaments much longer than the anthers, flexuose, and hispid at the base.

†482. (2) A. *Malabarica* (DC.:) leaves abruptly pinnated; leaflets quite entire: samaræ broadly-linear, rounded at both ends.—*DC. prod.* 2. *p.* 89.—*Rheed. Mal.* 6. *t.* 15.

We have every reason to suspect that Rheede's figure is extremely incorrect, and that this species, founded on it, is the same as the last. As to Rheede's descriptions, they are, as is well known, often faulty even when the plates are good, so that, in the present instance, no reliance can be placed on the carpels being united half way up, "lateribus carne intermedia termini et pauca conglutinatis."

Digitized by Google

ORDER XLIX.—SIMARUBEÆ. *Rich.*

Flowers usually bisexual, sometimes unisexual, regular. Calyx 4–5-divided. Petals as many as the sepals and alternate with them, hypogynous, spreading or connivent into a kind of tube: æstivation twisted. Stamens twice as many as the petals: each filament arising from the back of a hypogynous scale: anthers opening longitudinally. Torus a gynophore, bearing the stamens round its base, and the ovaries on its summit. Ovaries 5: ovule solitary in each cell, suspended from the inner angle near the apex: styles distinct at the base, but above it uniting into one: stigmas 4–5, distinct or combined. Fruit of 4–5 indehiscent drupes arranged round the summit of the gynophore. Seeds pendulous: testa membranaceous. Albumen none. Radicle superior, short, partly concealed within the thick cotyledons.—Shrubs or trees. Leaves alternate, exstipulate, without dots, simple or compound.

I. SAMADERA. *Gærtn. fr. t.* 156.—Niota. *Lam. ill. t.* 299.

Flowers bisexual. Calyx short, 4–5-partite. Petals 4–5, much longer than the calyx. Stamens 8–10, shorter than the petals. Gynophore short, narrow, stalk-like. Ovaries 4–5. Styles as many, distinct at the base, soon uniting together into one which is longer than the petals and terminated by an acute stigma. Fruit of 1 or more carpels (usually fewer than the ovaries from abortion), drupaceous.—Trees or shrubs. Leaves alternate, simple, reticulately veined. Peduncles axillary or terminal, pendulous in fruit, divided at the apex into a 5–12-flowered umbel.—Parts of the flower 4 or occasionally 5.

483. (1) S. *Indica* (Gærtn.:) arboreous: leaves oblong-elliptical; flower-bearing peduncle longer than the leaves, compressed, pendulous: calycine-segments 4–5, each marked with an external gland: drupe with a very thick pericarp.—*Gærtn. fr.* 2. *p.* 352, *t.* 156; *Wight! cat. n.* 361.—Niota pentapetala, *Poir. encycl. meth.* 4. *p.* 490; *DC. prod.* 1. *p.* 592.—N. tetrapetala, *Wall.!* (not *Lam.*) *L. n.* 6349.—N. Lamarckiana, *Blume.*—Vittmannia elliptica, *Vahl, symb.* 3. *p.* 5. *t.* 62?—*Rheed. Mal.* 6. *t.* 18.

The *N. tetrapetala* of Lamarck is a large shrub from Madagascar, has leaves about 2½ inches long and 1 broad, and fruit almost capsular: the present is a tall tree, and has the leaves 6–8 inches long, and 2½ or 3 inches broad. *N. lucida,* Wall. L. n. 1062, and Pl. As. rar. 2. p. 54. t. 168, principally differs from ours by the peduncles when in flower being erect and short, but when in fruit pendulous and elongated, as Vahl exhibits in his figure of *Vittmannia elliptica,* and which on that account we are more inclined to refer to Wallich's new species than to *S. Indica.* Dr Wallich says doubtfully of his plant that the anthers open by 1 or 2 pores at the apex, but this is contrary to the character both of the genus and of the order.

ORDER L.—OCHNACEÆ. *DC.*

Sepals 5, persistent: æstivation imbricated. Petals hypogynous, equal to or rarely more numerous than the sepals, deciduous, spreading: æstivation imbricated. Stamens 5, alternate with the petals, or

Digitized by Google

10, or indefinite, inserted on the hypogynous disk: filaments persistent: anthers 2-celled, erect, opening by pores. Ovaries as many as petals, distinct or rarely combined, seated upon the enlarged tumid torus: ovules solitary, erect: styles combined into one, which springs directly from the torus from between the bases of the ovaries. Fruit (a sarcobase) of several indehiscent drupaceous carpella, articulated with the torus. Seeds solitary. Albumen none. Embryo straight: radicle short, inferior: cotyledons thick.—Glabrous trees or shrubs. Leaves alternate, simple, stipulate. Pedicels jointed in the middle.

I. OCHNA. *Linn.; Schreb.; Lam. ill. t.* 472.

Petals 5–10. Stamens numerous; filaments filiform, persistent. Anthers ovate or linear, opening by a double cleft at the apex. Ovaries distinct. —Leaf-buds scaly. Flowers yellow, usually springing from below the leaves from the wood of the preceding year.

484. (1) O. *squarrosa* (Linn.:) leaves from narrow-oblong to oblong-ovate or obovate, obtuse or mucronate or acute or acuminated, serrated: flowers racemose, from the apex of very short lateral almost or quite leafless shoots: pedicels elongated: sepals oval, obtuse: petals and ovaries 7–12: stigma capitate: anthers linear, elongated.—*Linn. sp. p.* 781; *Roxb. fl. Ind.* 2. *p.* 643; *Cor.* 1. *t.* 89; *Wight! cat. n.* 471, 472, 473.—O. obtusata, *DC. prod.* 1. *p.* 735; *Spr. syst.* 2. *p.* 596; *Wall.! L. n.* 2805.—O. lucida, *Lam. ill. t.* 472. *f.* 1; *DC. l. c.; Spr. l. c. p.* 597.—O. nitida, *Wall.! L. n.* 2804. *b.*

There is often so complete a transition on the same individuals from the obtuse to the acute leaves, that we cannot hesitate to unite De Candolle's two species and restore the Linnean name. Wallich's L. n. 2805. *b.*, has the leaves linear-oblong and acuminated at both ends. *O. nana*, Ham.! (Wall. L. n. 3761) differs: it has leaves oblong-lanceolate, 5 petals larger than the calyx, and the inflorescence consists of an axillary compressed longish peduncle bearing at the top three loosely pedicellate flowers.

485. (2) O. *Wightiana* (Wall.:) leaves ovate, bluntish, rounded at the base, conspicuously veined, very slightly serrulated: pedicels solitary or in pairs from the apex of a very short leafless shoot: sepals oval, obtuse: petals and ovaries 5: stigma capitate.—*Wall.! L. n.* 2808; *Wight! cat. n.* 470.—Travancore.

486. (3) O. *Heyneana* (W. & A.:) leaves oblong-lanceolate, tapering at both ends, bluntish at the point, serrulated; veins inconspicuous: pedicels solitary, springing from the old wood (from a very short leafless branch?): sepals oval-oblong, obtuse.—O. parvifolia, *herb. Heyne; herb. Madr.; Wall.! L. n.* 2807.

We have only seen an imperfect specimen in Dr Hooker's herbarium; but we cannot believe this to be the same with *O. parvifolia* of Vahl, whether we consult the descriptions given by that botanist and by De Candolle, or look to the different countries from which they come: we have more doubts if it be distinct from *O. Wightiana*.

II. GOMPHIA. *Schreb.*

Petals 5. Stamens 10: filaments scarcely any: anthers long, pyramidal, erect, opening at the apex by a double pore. Ovaria distinct.—Racemes from the apex of a leaf-bearing branch.

487. (1) G. *angustifolia* (Vahl:) leaves elliptic-oblong, acuminated at both ends, slightly serrulated, shining: racemes compound: sepals broadly oval,

Digitized by Google

shorter than the petals: carpels obovate-reniform.—*Vahl, symb.* 2. *p.* 49; *DC. prod.* 1. *p.* 736; *Spr. syst.* 2. *p.* 318; *Wight! cat. n.* 469.—G. zeylanica, *DC. l. c.; Spr. l. c.; Wall.! L. n.* 2802.—O. Malabarica, *DC. l. c.; Spr. l. c.*—Ochna zeylanica, *Lam.—Burm. zeyl. t.* 56; *Rheed. Mal.* 5. *t.* 48 (good), 52 (monstrosity).——Travancore, and the southern provinces.

G. zeylanica, DC., as we feel certain from Ceylon specimens now before us, and from the good figure in Burmann, has the carpels thick in their upper part, but tapering and curved at the base as Gærtner has represented in his *Meesia* (or *Walkera*). As to *G. angustifolia* of Vahl, that botanist describes only a specimen in bud, in which state the sepals appear orbicular, and the leaves of a membranaceous texture: but we have adapted our character to older specimens. To the above synonyms of this plant, which appears to present little or no variation in its characters, we suspect that *Walkera serrata*, Willd., may be added: Gærtner no doubt describes and represents 5 stamens with ovate anthers, but they appear, from the figure, to have been shrivelled up, and not in a fit state for examination: he also says that the sepals are lanceolate, and so they appear at first sight in our *Gomphia*, from the rolling-in of the margins: besides, the figure in Rheede quoted by Gærtner is an excellent representation of our plant, Rheede also describing the flowers with "*aliquot* staminulis surrectis *acuminatis*," an obvious allusion to the long anthers. If we be correct, the genus *Walkera* must be restricted to an American plant, and the name consequently inadmissible; for *Walkera* is not in compliment to any botanist, but from the Cingalese appellation of Gærtner's plant being *Wal kæra* (wild hard-tree); it is, however, more generally called *Bo kæra* or divisioned-(on account of the fruit) hard-tree: if, however, it be not prudent to change the name even for the American plant, it may remain and be regarded henceforth as in honour of Colonel Walker, the present Governor of Ceylon, through whose interest our friends Dr Hooker and Dr Graham are now receiving valuable acquisitions from that island.

ORDER LI.—PITTOSPOREÆ. *R. Brown.*

Sepals 5, deciduous, distinct, or partially cohering: æstivation imbricated. Petals 5, hypogynous, sometimes slightly cohering: æstivation imbricated. Stamens hypogynous, 5, distinct, alternate with the petals. Torus not discoid, but often forming a stalk to the ovary of about the same thickness. Ovary solitary, usually imperfectly 2–5-celled; the dissepiments not uniting at the axis, and therefore apparently 1-celled: style 1: stigma 2–5-lobed, the lobes equal in number to the placentas. Fruit baccate, or capsular and loculicide; cells polyspermous, usually incomplete. Seeds covered with a glutinous or resinous pulp, or arillate. Embryo minute, contained in a fleshy albumen near the hilum: radicle long: cotyledons very short.—Leaves simple, alternate, exstipulate. Flowers sometimes polygamous.

I. PITTOSPORUM. *Banks; Gærtn. fr. t.* 59; *Pluk. t.* 392. *f.* 3.

Sepals 5. Petals 5, the claws approaching each other, and forming a tube. Capsule 2–3-valved, 1-celled, the valves bearing the placentæ along their middle or at their base. Seeds covered with a resinous pulp.—Shrubs with permanent entire leaves.

In the Indian species, there are only two cells to the ovary, and the dissepiments do not meet in the axis, so that the ovary is only incompletely 2-celled. As the

Digitized by Google

fruit advances towards maturity, the aperture between the dissepiments enlarges, so that the fruit is at length decidedly unilocular, and the only appearance of dissepiments is a ridge along the middle of each valve and at the bottom of the capsule. These plants thus form a beautiful illustration of the affinity between a 2-celled ovarium with placentæ in the axis, and a 1-celled fruit with parietal placentæ. On cutting the ovarium of the following species longitudinally, the lower half may be observed quite solid, and is, we conceive, a stalk-like torus, although externally an apparent continuation of the ovary.

488. (1) P. *floribundum* (W. & A.:) leaves thinly coriaceous, elliptic-lanceolate, glabrous, margin waved: racemes terminal, aggregated, many-flowered, compact; peduncles glabrous; pedicels glabrous, arranged usually in a somewhat umbellate manner: sepals minute, many times shorter than the corolla, ovate, acute, concave, ciliated at the apex, but otherwise glabrous: petals linear: ovary hairy: style glabrous: stigmas 2-lobed: ovules 4–6 in each cell of the ovary: capsule 2-valved, compressed, 3–4-seeded; valves thinnish, between crustaceous and coriaceous, inside transversely wrinkled.—*Wight! cat. n.* 976.——Columala.

This probably is the plant alluded to by Dr Wallich in his edition of Roxb. fl. Ind. 2. p. 393, as having been obtained from Heyne's herbarium, and resembling the *Celastrus verticillatus*, Roxb. (in E. I. C. mus. tab. 1804), which De Candolle has referred to *Senacia*, but which seems to us from the description and figure to be a *Pittosporum*.

489. (2) P. *Neelgherrense* (W. & A.:) leaves thin-coriaceous, elliptic-lanceolate, glabrous: racemes terminal, 2–3 together, few- (1–4-) flowered, lax; peduncles glabrous; pedicels glabrous, slender, alternate: sepals minute, many times shorter than the corolla, lanceolate, acuminated, flat, glabrous, slightly ciliated: petals linear: ovary hairy: style glabrous: stigma 2-lobed: ovules 4–6 in each cell: capsule compressed, 2-valved, 4–6-seeded; valves thick, between fleshy and coriaceous.—*Wight! cat. n.* 141, 544.——Neelgherries.

No. 141 was sent formerly to Dr Wallich as *P. viridiflorum*, and 544 (in fruit) without a name, but we cannot find any trace of either in Wallich's List. Both flowers and fruit are much larger than in the last species. In this, each mass of inflorescence seems to produce but very few mature fruits, which are of a yellowish-green colour: in the other, the fruit is abundant, and nearly black.

490. (3) P. *tetraspermum* (W. & A.:) leaves elliptic-oblong, acute, coriaceous, glabrous, margins slightly waved and recurved: flowers in a terminal sessile umbel; peduncles aggregated into a terminal sessile umbel, usually 1-, rarely 2-flowered, pubescent: sepals pubescent, lanceolate, acuminated, minute, many times shorter than the corolla: petals linear: ovary hairy: style glabrous: stigmas 2-lobed: ovules 2 in each cell: capsule nearly globose, scarcely compressed, 4-seeded; valves thick-coriaceous.—*Wight! cat. n.* 142.

Digitized by Google

II.—CALYCIFLORÆ. *DC.*

Sepals more or less united together at the base. Torus lining the bottom of the calyx. Petals and stamens springing from the adnate part of the torus (commonly said to be inserted on the calyx). Petals distinct or united together. Ovary free or united with the tube of the calyx.

Cl. 2.—Peripetalæ. *Juss.*

Torus between the ovary and the tube of the calyx, but not forming a disk on the summit of the ovary. Petals distinct, and stamens perigynous.

ORDER LII.—CELASTRINEÆ. *R. Brown.*

Sepals 4–5, united at the base: æstivation imbricated. Petals as many as the sepals and alternating with them, with a broad base, inserted under the margin of the torus; very rarely wanting: æstivation imbricated. Stamens alternate with the petals, and as many, inserted on the margin or disk of the torus: anthers 2-celled, dehiscing on the inner side. Torus a large thick fleshy flat disk, covering the bottom of the calyx. Ovary more or less immersed in and adhering to the torus, 2–5-celled, or rarely from abortion 1-celled: ovules usually two (sometimes only one, sometimes several) in each cell, attached to the axis, and usually at its base, at first ascending (sometimes afterwards by the elongation of the axis peritropal, or at last resupinately pendulous): styles 2–5, usually combined into one, sometimes distinct: stigmas combined or distinct. Fruit free from the calyx, 2–5-celled (often partly abortive); either indehiscent, drupaceous, or baccate; or samaroid; or membranaceous and follicular; or capsular, 3–4-valved, and loculicidal. Seeds one or several in each cell, sometimes arillate. Albumen usually fleshy, sometimes very thin or wanting. Embryo straight: radicle short, pointing to the hilum: cotyledons usually thick. —Shrubs or trees. Leaves alternate or opposite.

The divisions of the flower are occasionally increased by one part. The principal character of this tribe consists in the large flat disk, the stamens as many as the petals, and alternating with them. To this may be added the imbricated æstivation, but if *Perrottetia* of Kunth belong to it, the æstivation of the petals is sometimes valvular: indeed that character and the simple leaves seem to constitute almost the only difference between that genus and *Turpinia*. *Myginda* (of which *M. ilicifolia*, *myrsinoides*, and *myrtifolia*, having a bilocular ovary with two erect ovules in each, form a distinct genus, as has been already remarked by Kunth), and *Hartogia* belong to *Celastrineæ* and not to *Ilicineæ*: *Curtisia* can be referred to neither. *Staphyleaceæ*

Digitized by Google

only differs from the other *Celastrineæ* by the compound leaves and bony seeds, the other characters proposed being common to both: we therefore do not think it necessary to retain the section.

I. TURPINIA. *Ventn.*—Dalrymplea. *Roxb.*

Flowers polygamous or bisexual. Calyx 5-partite, persistent. Petals 5. Torus discoid, with a free 10-crenulated margin. Stamens 5, inserted under the margin of the disk, alternate with the petals: anthers ovate, dehiscing longitudinally. Carpels 3, follicular, at first distinct or separable, soon combining into one ovary, lower part immersed in the disk: ovules 2–8 in each carpel. Styles 3, separable. Stigmas patent, flat, cuneate. Fruit baccate, 3-celled (or with fewer cells by abortion). Seeds 1–3 in each cell, bony and shining, truncated at the hilum, fixed along the axis or to its apex. Albumen fleshy. —Trees or shrubs. Leaves opposite, unequally pinnated; leaflets coriaceous, glabrous, stalked, ovate or oblong, acuminated, serrated. Flowers white, panicled: branches of the panicle alternate (in the American species), or opposite (in the Indian).

When the fruit of the American or West Indian species is better known, characters will probably be found to distinguish Roxburgh's genus *Dalrymplea*.

491. (1) *T. nepalensis* (Wall.:) leaflets 3–5, oblong-lanceolate, acuminated, coriaceous: branches of the panicle opposite: styles almost quite distinct: ovules 3 or occasionally 2 in each cell: berry (immature) scarcely fleshy, marked on the outside above the middle with 3 small distant points (the remains of the styles), about 3-seeded: seeds pendulous: radicle superior.—*Wall.! L. n.* 4277; *Wight! cat. n.* 396.——Mountainous districts.

We can see no difference between ours and Dr Wallich's specimens from Nepal, but the latter are only in flower: if characters be found to separate them, the Peninsular one may called *T. microcarpa*, the fruit not exceeding the size of a large pea: the pericarp or fleshy part is very thin, and dry, so that it might be termed a dry-berry. We have not observed more than three seeds in each fruit, one in each cell when all the cells are perfect, occasionally two in one cell and one in another when one of the cells becomes abortive.

II. ELÆODENDRON. *Jacq.?; Roxb.*

Calyx 5-parted. Petals 5, expanding, linear-oblong. Torus 5-angled, very thick, fleshy. Anthers 5, inserted into the margin of the torus: filaments at length recurved: anthers with a thick connectivum at the back, roundish, opening longitudinally. Ovary immersed in the disk, 2-celled: ovules 2 in each cell. Style short, conical. Stigma simple, obtuse. Fruit drupaceous, dry or pulpy: nut 1-2-celled. Seeds usually solitary, rarely in pairs, with a membranaceous or spongy integument, erect. Albumen none. Cotyledons thick, fleshy: radicle inferior.—Small trees. Leaves opposite, entire, glabrous. Peduncles axillary, branching dichotomously.

We have no opportunity at present of examining the fruit of *E. orientale*, the original species of the genus: if Gærtner be correct in describing it as a 3-celled drupe, and the seeds with a fleshy albumen and remarkably thin membranaceous cotyledons, the Indian species must be again removed, and the genus *Schrebera* of Retz (not Roxb.) retained for them: or as this might now cause much confusion, *Rubentia*, Comm. and Juss. might be restored for *E. orientale*, while the Indian species may constitute *Elæodendron*: this last would be preferable to giving the name of *Neesija* to *E. glaucum* and *E. Roxburghii*. The American and New Holland species require much elucidation, but they do not appear to belong to the genus. *E. viride*, Ham.! (Wall.! L. n. 4326), appears to us to be allied to *Holigarna* and *Mangifera oppositifolia*, Roxb. (not, however, a *Mangifera*), among the *Terebinthaceæ*: its male flowers only are known.

Digitized by Google

492. (1) E. *Roxburghii* (W. & A.:) leaves elliptical or ovate, crenate-serrated, young ones glaucous: cymes lax, dichotomous, divaricated, about half the length of the leaves, usually with a solitary pedicellate often caducous flower in the forks: drupe 1-celled, obovoid; nut somewhat crustaceous and soft.—*Wight! cat. n.* 485, 487, 488.—E. glaucum, *Wall.! L. n.* 4325. *a, c, e.*—E. ——? *Roxb. in E. I. C. mus. tab.* 73.—Nerija dichotoma, *Roxb. fl. Ind.* 1. *p.* 646; (*ed. Wall.*) 2. *p.* 444.—Rhamnus Nerija, *Spr. syst. supp. p.* 86.——Courtallum, and mountainous parts of the Coromandel coast.

Roxburgh has erroneously described this as a berry: on cutting across the fruit, however, the putamen can be distinguished from the thin fleshy coat. Wight's n. 488 has more the habit of *E. glaucum* (in which the drupe is nearly spherical, and has a very thick and hard putamen, with occasionally 2 cells) than the others, but in the absence of fruit we refer it to *E. Roxburghii*, as it does not appear that the true *E. glaucum* has been yet found out of Ceylon, the plants mistaken for it, from Coromandel, being either referable to the present or to the following species.

493. (2) E. *paniculatum* (W. & A.:) leaves elliptical, green, bluntly serrated, on long petioles: panicles dichotomous, without a flower in the fork, about as long as the leaves; ultimate pedicels ternate.—*Wight! cat. n.* 489.—E. glaucum, *Wall.! L. n.* 4325. *f.*——Colemala.

Our specimens are not in fruit: the whole habit is considerably different, but perhaps future observations may prove it to be only a variety of the preceding species.

III. PLEUROSTYLIA. *W. & A.*

Calyx 5-parted. Petals 5, with a broad base. Stamens 5: filaments flat, shorter than the petals, attached below the margin of the torus: anthers with a broad connectivum at the back, opening longitudinally. Torus a thick crenulated fleshy disk. Ovary half immersed in the torus, 2-celled, or usually from abortion only 1-celled (the other being almost always rudimentary and scarcely to be traced): ovules 2, collateral, in each perfect cell. Style short and thick. Stigma large, somewhat peltate. Fruit indehiscent, 1- (or occasionally 2-) celled: sarcocarp thin and fleshy, marked on the one side about the middle with the remains of the style: endocarp a crustaceous membrane, separable from the sarcocarp, with several irregular clefts at the base around the hilum of the seed. Seed erect, solitary, covered by the endocarp like an arillus. Albumen copious, fleshy. Cotyledons large, orbicular, flat: radicle inferior.—Shrubs. Leaves opposite, entire and quite entire, whitish, shortly petioled. Peduncles axillary or terminal, scarcely longer than the petioles, few-flowered.

This genus is remarkable for the one cell becoming usually abortive, even in the ovary: although, however, it be then perfect, it very rarely indeed comes to maturity. The fruit is obviously a modification of a 2-lobed drupe with two 1-celled nuts: whereas *Elæodendron*, when complete, would exhibit a simple drupe with one 2-celled nut: but independently of that consideration, the peculiar arilliform putamen, and structure of the seed, will keep the present genus quite distinct.

494. (1) P. *Wightii* (W. & A.:) leaves elliptic-oblong.—*Wight! cat. n.* 481.—Celastrus? Wightiana, *Wall.! L. n.* 4322.——Narthamala. Southern provinces.

495. (2) P. *Heynei* (W. & A.:) leaves narrow oblong-lanceolate.—*Wight! cat. n.* 486.—Celastrus opposita, *Wall.! in Roxb. fl. Ind.* (*ed. Wall.*) 2. *p.* 398; *L. n.* 4314; *Spr. syst. suppl. p.* 88.——Southern provinces.

We have considerable doubts of these two species being distinct.

Digitized by Google

IV. CELASTRUS, *Linn.; Gærtn. fr. t.* 95.

Calyx 5-parted. Petals 5, sessile. Torus a fleshy orbicular disk. Stamens 5, inserted into or under the margin of the disk: anthers opening longitudinally. Ovary sessile on or half immersed in the disk, 2–3-celled; ovules usually in pairs, rarely 5–6 in each cell. Styles thick, entire or 2–3-cleft. Capsule 2–3-celled, the dissepiments sometimes incomplete or evanescent. Seeds 1–2 in each cell. Albumen fleshy. Cotyledons foliaceous.—Shrubs with alternate leaves. Peduncles many-flowered, axillary or arranged in terminal panicles.

Notwithstanding this character be very comprehensive, it will exclude several plants generally admitted into the genus: of these *C. bivalvis*, Jack, will form an allied genus: *C. striata*, Thunb., ought probably to be excluded from the order: *C. micrantha*, Roxb., with pinnated leaves, can never be of this genus: *C. verticillata*, Roxb., belongs to *Pittosporeæ*. Perhaps our first section, as has been already pointed out by Kunth, ought alone to be retained in *Celastrus*: but if the genus is to be retained according to our definition, it may be divided into various sections on a much better principle than that adopted by De Candolle. Of the published Indian ones, *C. robusta*, Roxb., (having the ovary and capsule 2-celled, and the style almost divided to the base) will be the type of one section: *C. monosperma*, Roxb. (with the ovary 3-celled, but the capsule 1-celled 1-seeded and 3-valved, the seed with a complete arillus), of another. The Cape species are scarcely known, but *C. pterocarpa* with its allies may form a little group; while *C. pyracantha*, the only one we believe that has more ovules than two in each cell, will be readily recognised by that character from all the other species. We do not give a description of *C. trigyna*, Lam. (Wall. L. n, 4315; Wight! cat. n. 503; *C. obtusifolia*, Roxb.) the specimens being from the Mauritius.

§ 1. Eucelastrus. *Polygamous-dioecious. Stamens arising from the margin of the disk. Ovary 3-celled, sessile on the disk: ovules 2 in each cell, with a cup-shaped arillus at their base. Style entire. Stigmas combined into one which is lobed and papillose. Capsule globose, 3-celled. Seeds surrounded by an entire fleshy arillus.—Climbing unarmed shrubs. Leaves of a thinnish texture.*

496. (1) C. *paniculata* (Willd.:) unarmed, climbing; young shoots and flower-bearing branches pendulous: leaves broadly oval or ovate or obovate, usually with a sudden short acumination, slightly serrated, glabrous: racemes terminal, compound or supra-decompound, elongated, much longer than the uppermost leaves: calyx-lobes rounded, ciliated: margin of the torus thin, free: capsule globose, 3-celled, 3–6-seeded: seed with a complete arillus.—*Willd. sp.* 1. *p.* 1125; *Roxb. fl. Ind.* 1. *p.* 621; (*ed. Wall.*) 2. *p.* 388; *in E. I. C. mus. tab.* 188; *DC. prod.* 2. *p.* 6; *Spr. syst.* 1. *p.* 775; *Wall.? L. n.* 4310; *Wight! cat. n.* 480.—C. nutans, *Roxb. fl. Ind.* 1. *p.* 623; (*ed. Wall.*) 2. *p.* 390; *in E. I. C. mus. t.* 1805; *DC. prod.* 2. *p.* 6; *Spr. syst. supp. p.* 89; *Wall.! L. n.* 4301.—C. Rothiana, *Schult.*; *DC. prod.* 2. *p.* 8.—Ceanothus paniculatus, *Heyne! in Roth. nov. sp. p.* 154; *Spr. syst.* 1. *p.* 772.—Scutia paniculata, *G. Don in Mill. dict.* 2. *p.* 34.

Roxburgh first of all gave the specific name we have retained, when he received specimens from the Circar mountains from his collectors: and under the same Heyne and the missionaries transmitted specimens to Willdenow and Roth, by whom they were published in Europe either as *Celastrus* or *Ceanothus*. Roxburgh not having seen the plants growing, has erroneously figured and described the panicles erect; so that afterwards when he obtained living plants from Mysore, sent by Heyne to the Calcutta garden, he did not recognise his own plant, but made another figure and description under the name *C. nutans*. Wallich's L. n. 4310. has a somewhat different aspect, but we scarcely think it differs as a species. *C. dependens*, Wall., or *C. multiflorus*, Roxb. (in E. I. C. mus. t. 1806.) appears to belong to this section.

Digitized by Google

§ 2. Gymnosporia. *Bisexual? Stamens inserted under the margin of the disk. Ovary 3-celled, half immersed in the disk. Ovules 2 in each cell, naked at the base. Style more or less 3-cleft. Stigmas spreading, emarginate. Capsule 3-angled, 3-celled. Seeds apparently without an arillus, or with a very short imperfect membranaceous one at the hilum.—Rigid scraggy shrubs, generally with thorns. Leaves coriaceous.*

497. (2) C. *Heyneana* (Roth.:) unarmed: leaves elliptical, coriaceous, glabrous, slightly crenate-serrated, petioled: cymes axillary dichotomously compound, not half the length of the leaves: capsules (large) turbinate, 3-celled: seeds about 2 in each cell, obovoid, shining.—*Roth. in Ræm. & Schult. syst. 5. p.* 421 (partly); *DC. prod. 2. p. 7; Wight! cat. n.* 476.—C. serrulata, *Roth. nov. sp. p.* 155 (partly); *Spr. syst. 1. p.* 775.—C. Wallichiana, *Wall.! L. n.* 4304. *c* (partly).

Roth's specific character is derived principally from the present species; but in his description the "folia obovata in petiolum attenuata," belongs we think to the next: while the small capsules seem to have been obtained from *C. emarginata* or *C. montana*. All the four, however, although much confused, even by Dr Wallich, are we believe quite distinct.

498. (3) C. *Rothiana* (W. & A. not Schult.:) unarmed: bark on the older branches thick, rugged: young branches short with a few alternate leaves, or almost none (like tubercles from the old branches) with fascicled leaves: leaves coriaceous, glabrous, broadly obovate, crenate-serrated, cuneate at the base and tapering much and suddenly into the petiole: cymes much shorter than the leaves, dichotomous, axillary or terminal on the young shoots, or fascicled from the tubercles of the older branches.—*Wight! cat. n.* 475.—C. serrulata, *Roth. nov. sp. p.* 156 (partly).—C. Wallichiana, *Wall. L. n.* 4304. *c* (partly).

499. (4) C. *Wallichiana* (Spr.:) branches flexuose, thorny; young shoots and thorns with a polished spotted bark: thorns bearing both leaves and flowers: leaves coriaceous, glabrous, obovate, slightly crenulate-serrated, cuneate and attenuated at the base into the short petiole: cymes from among the leaves, dichotomous, few-flowered, much shorter than the leaves: capsules (large) roundish, 3-angled.—*Spr. syst. 5.* (*index*) *p.* 150 (under *C. rigida*); *Wall.! L. n.* 4304. *a, c* (partly), *d*; *Wight! cat. n.* 474.—C. rigida, *Wall. in Roxb. fl. Ind.* (*ed. Wall.*) *2. p.* 396.—C. buxifolia, *Herb. Madr.; Roxb. hort. Bengh. p.* 18.—Catha Wallichii, *G. Don in Mill. dict. 2. p.* 9.

500. (5) C. *ovata* (Wall.:) leaves short, petioled, roundish-ovate, slightly cordate at the base, minutely crenulate-toothed, very hard and thick, glabrous (brown when dried): peduncles axillary, short, bearing numerous short pedicellate small flowers: capsule (large) turbinate, 3-angled.—*Wall.! L. n.* 4308.

Of this we have only seen one small specimen, and that in the Linnæan Society's Indian herbarium. Most of the flowers have fallen off without producing fruit, so that a suspicion might be raised as to their being polygamous or monœcious. It is readily distinguished from *C. montana* by the leaves becoming brown instead of bluish-white, by the form of inflorescence, and by the much larger capsules. The capsules of this, of *C. Heyneana* and *C. Wallichiana*, are the size of small hazel nuts: those of *C. Rothiana* are yet unknown.

501. (6) C. *montana* (Roxb.:) thorny; young branches occasionally unarmed, smooth (purplish): leaves elliptical or obovate, tapering at the base into the petiole, minutely and rather sharply crenate-serrated, coriaceous, glabrous, whitish-glaucous (when dried): cymes axillary, lax, peduncled, about twice as long as the petiole: style deeply divided: capsules somewhat

Digitized by Google

globose, 3-angled (about the size of a pea, black when dry).—*Roxb. fl. Ind.* 1. *p.* 620; (*ed. Wall.*) 2. *p.* 387; *Roth. nov. sp. p.* 154; *DC. prod.* 2. *p.* 9; *Spr. syst.* 1. *p.* 774; *Wall.! L. n.* 4306; *Wight! cat. n.* 478, 479.—C. emarginata, *Wall.! L. n.* 4305. *b* (partly).—C. Wallichiana, *Wall.! L. n.* 4304. *b* (partly)—C. crenata, *Roth. nov. sp. p.* 156. (not *Forst.*)—Staphylea montana, *Roxb. in E. I. C. mus. tab.* 594.—Catha montana, *G. Don, in Mill. dict. p.* 10.

The ovary and capsule are occasionally only 2-celled. The young branches are sometimes pointed with a thorn as in *C. Wallichiana* and *C. emarginata*. Roth's *C. crenata* was described from some young shoots which wanted thorns: Wight's cat. n. 478. is in this state. The fruit of the present and following is scarcely the size of a small pea.

502. (7) *C. emarginata* (Wild.:) branches flexuose, thorny: leaves shortly petioled, obovate, obtuse or emarginate, attenuated at the base, quite entire, very thick, hard and coriaceous, glabrous, pale and shining: peduncles axillary very short or wanting, bearing several fascicled 1-flowered pedicels: capsules slightly turbinate, 3-angled (about the size of a pea, black when dry).—*Willd. sp.* 1. *p.* 1128; *Roxb. fl. Ind.* 1. p. 620; (*ed. Wall.*) 2. *p.* 387; *Roth. nov. sp. p.* 155; *DC. prod.* 2. *p.* 8; *Spr. syst.* 1. *p.* 775; *Wall.! L. n.* 4305; *Wight! cat. n.* 477.—Staphylea vepretum, *Roxb. in E. I. C. mus. tab.* 593.—Catha emarginata, *G. Don, in Mill. dict.* 2. *p.* 9.

The young short shoots being often spinescent at the extremity, as in some of the other species, are frequently described as leaf-bearing-thorns: but in these plants the thorns, when axillary, are obviously abortive shoots: or when terminal are abortive continuations of the leaf's shoots; and, as may in such a case be expected, are sometimes both to be seen on the same specimen.

V. EUONYMUS, *Linn.*

Calyx 4–5-parted. Petals 4–5, sessile. Torus a fleshy orbicular disk. Stamens 4–5, inserted on the surface of the disk, between the margin and ovary: base of the filaments persistent, and forming glandular projections on the torus: anthers with a thick connectivum at the back, opening transversely or longitudinally. Ovary immersed in the disk, with as many cells as petals: ovules 2 in each cell. Style short and thick. Stigmas united into one, obtuse or lobed. Capsules 4–5-celled, 4–5-valved, loculicidal. Seeds 1–2 in each cell.—Trees or shrubs, sometimes climbing by means of roots thrown out by the stems. Leaves opposite. Peduncles axillary. Flowers occasionally with a fourth or fifth part additional.

503. (1) E. *dichotomus* (Heyne:) leaves shortly petioled, coriaceous, from narrow oblong-lanceolate to ovate-lanceolate, tapering at both ends, blunt at the point, quite entire: peduncles solitary or 2–3 together, from simple to twice or thrice dichotomous, few-flowered, about one-third of the length of the leaves: petals 5, orbicular: style scarcely any: stigma blunt: capsule (unripe) "clavate, longthened, tapering downwards; its vertex 5-lobed, retuse; lobes short, round."—*Heyne in Roxb. fl. Ind.* (*ed. Wall.*) 2. *p.* 410; *Spr. syst. suppl. p.* 92; *Wall.! L. n.* 4289; *Wight! cat. n.* 484.——Courtallum, Colemala.

We have not seen the fruit: Dr Wallich and Heyne seem only to have seen it far from maturity.

† 504. (2) E. *Indicus* (Heyne:) leaves from lanceolate to ovate-lanceolate, obtusely acuminated, attenuated at the base, quite entire, coriaceous, shortly petioled: peduncles solitary, 1–3-flowered, about twice as long as the petioles: petals 5, oval, ciliated: capsule (unripe) obovate-clavate, tapering at the base, retuse at the apex and furnished with 5 short rounded projecting wings.—*Heyne in Roxb. fl. Ind.* (*ed. Wall.*) 2. *p.* 410; *Spr. syst. suppl. p.* 93; *Wall. L. n.* 4290.

Digitized by Google

This we have not seen: Dr Wallich says it is much allied to the former, but that *E. dichotomus* "has smaller flowers and lengthened 5-lobed, but not 5-winged capsules;" to which he adds, "much narrower leaves, more numerous dichotomous peduncles;" but in *E. dichotomus* we find every variation of leaf and inflorescence ascribed to the other: the fruit moreover was unripe in both, so that the differences noted are probably from their being in different stages of growth. Dr Wallich, indeed, in his List, suggests that the two species are not distinct.

505. (3) E. *crenulatus* (Wall.:) leaves elliptical, obtuse, short petioled, crenulate-serrated towards the apex, coriaceous, convex and bullate above: peduncles solitary, shorter than the leaves, once or twice dichotomous, few-flowered: petals 5 (or occasionally 6) orbicular: stamens very short; anthers opening transversely: margin of the torus free: style very short; stigma blunt, somewhat umbilicated: capsules turbinate, 5-celled, lobed at the apex: seeds solitary in each cell; hilum truncate, without an arillus.—*Wall.! L. n.* 4297; *Wight! cat. n.* 482, 483.—Elæodendron Neelgherrense, *Wall.! L. n.* 4409.——Neelgherries.

This, without an arillus, may constitute a section of the genus, to which probably the two species above described will also be found to belong.

ORDER LIII.—RHAMNEÆ. *Juss.*

Calyx 4–5-cleft; æstivation valvate. Petals distinct, unguiculate, cucullate or convolute or rarely flat, inserted into the throat of the calyx, sometimes wanting. Stamens definite, opposite the petals. Torus a flat or urceolate disk. Ovarium free or more or less immersed in the disk or adhering to the tube of the calyx, 2–3–4-celled: ovules solitary, erect. Fruit free or more or less cohering with the calyx, fleshy and indehiscent, or dry and separating in three cocci. Seeds erect. Albumen fleshy, rarely none. Embryo about as long as the seed: radicle short, inferior: cotyledons large, flat.—Trees or shrubs, often thorny. Leaves simple, alternate (or rarely opposite), minutely stipulate.

"From this order must undoubtedly be excluded *Natsiatum herpeticum*, Ham.! (Wall.! L. n. 4252.) a genus which, with *Phytocrene*, Wall., will form a small order, connecting in many points the *Menispermaceæ* with *Urticaceæ*: the ovary is 1-celled, with 2 ovules pendulous from its apex; style scarcely any; stigmas 2, elongated, recurved, papillose, as in *Celtis*." ARN.

I. ZIZYPHUS. *Tourn.; Desf.; Lam. ill. t.* 185.

Calyx patent 5-cleft. Petals obovate, unguiculate, convolute. Stamens exserted: anthers ovate, 2-celled, opening longitudinally. Disk flat, pentagonal, expanded, adnate to the tube of the calyx. Ovary 2–3-celled, immersed in the disk and adnate to it. Styles 2–3, diverging or combined. Fruit fleshy, containing a 1–2-celled nut. Seeds sessile, compressed, very smooth.—Shrubs or trees, with flexuose branches. Stipules usually 2, thorny, persistent, the one straight and the other recurved; or solitary and spinescent, the other being abortive or caducous; or rarely both caducous. Leaves alternate, 3-nerved. Cymes axillary, few-flowered, usually much shorter than the leaf, often sessile.

The Peninsular species which we have seen may be thus summarily characterised. —*Z. rugosa*, a panicle and a thin nut.—*Z. glabrata*, glabrous leaves.—*Z. xylopyrus*, leaves ashy-coloured beneath, and a large 3-celled nut.—*Z. Jujuba*, leaves of a bright tawny colour beneath.—*Z. nummularia*, long slender thorns, and small leaves.—*Z. Œnoplia*, leaves very oblique, acuminated, and acute.

Digitized by Google

506. (1) Z. *rugosa* (Lam.:) leaves broadly oval, serrated, young ones downy beneath, old one nearly glabrous except on the nerves: prickles short, usually solitary on the branches, with a broad densely pubescent base: cymes long-peduncled, forming on the leafless branches a large terminal panicle: ovary 2-celled: styles 2, united at the base: drupe obovate, with a very thin 1-celled 1-seeded putamen.—*Lam. encycl. meth.* 3. *p.* 319; *DC. prod.* 2. *p.* 20; *Spr. syst.* 1. *p.* 770; *Wight! cat. n.* 497.—Z. latifolia, *Roxb. fl. Ind.* 1. *p.* 607; (*ed. Wall.*) 2. *p.* 355; *DC. l. c.; Spr. syst. suppl. p.* 87; *Wall.! L. n.* 4240.—Z. paniculata, *Herb. Madr.!*; *Roth, nov. sp. p.* 161; *DC. l. c.; Spr. syst.* 1. *p.* 770; *Wall.! L. n.* 4241.—Z. obliqua, *Heyne! in Roth. nov. sp. p.* 160; *DC. l. c.*—Rhamnus Napeca, *Roxb. in E. I. C. mus. tab.* 581.—R. glabratus, *Heyne! in Wall.! L. n.* 7479.

507. (2) Z. *glabrata* (Heyne:) unarmed: leaves ovate-oblong or obovate, obtuse, crenate-serrated, glabrous, coriaceous: stipules both caduceous: cymes scarcely longer than the petioles: ovary 2-celled: styles 2, nearly distinct: drupe turbinate: nut hard and thick, obovate, rugose, flattened, 1-2-celled.—*Heyne in Roth, nov. sp. p.* 159; *Wight! cat. n.* 493, 494.—Z. trinervia, *Roxb.!* (not *Poir.*) *fl. Ind.* 1. *p.* 606; (*ed. Wall.*) 2. *p.* 354; *Spr. syst. suppl. p.* 87; *Wall.! L. n.* 4231.—Z. trinervia β, *Roth, l. c.*

508. (3) Z. *xylopyra* (Willd.:) arboreous: stipulary prickles solitary or in pairs (in a poor soil), or wanting: leaves broadly elliptical or orbicular, obtuse, slightly cordate at the base, serrulated; under side pale, softly pubescent, finely reticulated; upper when young pubescent: cymes short: ovary 3-celled: styles 3, united below: drupe turbinate; nut hard and thick, nearly globose, slightly rugose, 3-celled.—*Willd. sp.* 1. *p.* 1104; *Roxb. fl. Ind.* 1. *p.* 611; (*ed. Wall.*) 2. *p.* 360; *DC. prod.* 2. *p.* 21; *Spr. syst.* 1. *p.* 771; *Wall.! L. n.* 4239; *Wight! cat. n.* 495, 496.—Z. elliptica, *Roxb. fl. Ind.* 1. *p.* 610; (*ed. Wall.*) 2. *p.* 359.—Z. Caracutta, *Roxb. fl. Ind.* 1. *p.* 612; (*ed. Wall.*) 2. *p.* 361; *Spr. syst. suppl. p.* 87; *Wall. L. n.* 4238.—Z. rotundifolia, *Roth, nov. sp. p.* 160.—Z. orbicularis, *Schult.; DC. prod.* 2. *p.* 21.—Rhamnus xylopyrus, *Retz, obs.* 2. *p.* 11; *Roxb. in E. I. C. mus. tab.* 579.

This species may always be readily recognised by the leaves pale and soft beneath, and the 3-celled ovary: on which account we are inclined to add to the above synonyms *Z. ruminata*, Ham.! in Wall. L. n. 4236.

509. (4) Z. *Jujuba* (Lam.:) arboreous: stipulary prickles short, in pairs or solitary, often wanting, especially on the young branches: leaves elliptical, or oblong, obtuse, sometimes with a few coarse teeth at the apex, serrulated, acutish or obtuse or slightly cordate at the base; upper side glabrous; under, as well as the petioles and young branches, covered with a dense short tawny (when dried) tomentum: cymes sessile or very shortly peduncled: ovary 2-celled: styles 2, united to the middle: drupe spherical: nut rugose, hard and thick, 2-celled.—*Lam. enc. meth.* 3. *p.* 318; *DC. prod.* 2. *p.* 21; *Spr. syst.* 1. *p.* 770; *Roxb. fl. Ind.* 1. *p.* 608; (*ed. Wall.*) 2. *p.* 357; *Wall.! L. n.* 4244; *Wight! cat. n.* 500, 501.—Z. trinervia, α, *Roth, nov. sp. p.* 158.—Z. Mauritiana, *Wall.! L. n.* 4245.—Z. Sororia, *Schult.; DC. prod.* 2. *p.* 21.—Rhamnus Jujuba, *Linn.; Roxb. in E. I. C. mus. tab.* 578.—*Rheed. Mal.* 4. *t.* 41; *Rumph. Amb.* 2. *t.* 36; *Pluk. t.* 312. *f.* 4.

510. (5) Z. *nummularia* (W. & A.:) shrubby; branches from near the root, slender, flexuose, with a whitish cuticle: stipulary thorns in pairs; the upper one straight, slender, very sharp, and about as long as the leaves: leaves ovate or elliptical or orbicular, serrulated; under side with a short dense greyish tomentum: cymes sessile, very short: ovary 2-celled: styles 2, united to above the middle.—*Wight! cat. n.* 498.—Z. microphylla, *Roxb. fl. Ind.* 1. *p.* 613; (*ed. Wall.*) 2. *p.* 362; *Spr. syst. suppl. p.* 87; *Wall.! L. n.* 4232.—Z. rotundifolia, *Lam.; DC. prod.* 2. *p.* 21; *Spr. syst.* 1. *p.* 770.—Rhamnus nummularia, *Burm. Ind. p.* 61.—R. microphyllus, *Roxb. in E. I. C. mus. tab.* 1222.—*Pluk. t.* 197. *f.* 2.——Palamcotta. Courtallum.

Digitized by Google

We have preferred restoring the specific name given by Burman to that in Roxburgh, although the latter certainly be more expressive.

511. (6) Z. *Œnoplia* (Mill.:) shrubby, climbing, thorny: branches nearly glabrous; young shoots pubescent: leaves very obliquely ovate, acuminated, acute or obtuse or retuse at the base, slightly serrulate or almost quite entire; under side shortly tomentose, of the young ones rusty-coloured villous and silky: cymes short: ovary 2-celled: styles combined to above the middle: drupe globose: nut rugose, usually 1-celled, the other cell being abortive.—*DC. prod.* 2. *p.* 21; *Spr. syst.* 1. *p.* 771; *Roxb.? fl. Ind.* 1. *p.* 611; (*ed. Wall.*) 2. *p.* 360; *Wall.! L. n.* 4246; *Wight! cat. n.* 499.—Z. scandens, *Roxb. hort. Bengh. p.* 17; *Wall. L. n.* 7269.—Z. Napeca, *Roth, nov. sp. p.* 159 (not *Willd.*); *Roxb.? fl. Ind.* 1. *p.* 613; (*ed. Wall.*) 2. *p.* 363.—Rhamnus Œnoplia, *Linn.?*.—R. Napeca, *Linn.?*—*Burm. Zeyl. t.* 61.

This is certainly *Z. Napeca* of Roth, and we think also of Roxburgh, although he does not mention the acuminated leaves: but Dr Wallich has ascertained that the plant of that name in all the missionaries' herbaria is referable to the present species, and the presumption is, from the continual interchange of specimens and names between them, that Roxburgh had the same in view. As to *Z. Napeca*, Willd., it appears more allied to *Z. glabrata*; but *Rhamnus Napeca* of Linnæus is very uncertain. The synonym of Plukenet quoted by him resembles *Z. sinensis* or even *Z. vulgaris*, and Rumph. Amb. 2. t. 37. (not 42. as in De Candolle) is considered by Dr Hamilton to be a species of *Elæagnus*.

† 512. (7) Z.? *horrida* (Roth:) leaves ovate or roundish, obtuse or slightly acuminated, crenulated; under side pubescent on the nerves: stipulary prickles solitary or in pairs, stout, shining: cymes small, corymbose, dichotomous, axillary and lateral.—*Roth, nov. sp. p.* 159; *DC. prod.* 2. *p.* 20; *Spr. syst.* 1. *p.* 770.

This, if the description be correct, appears scarcely to differ from *Z. Napeca*, Willd., but in Heyne's harbarium (from whom Roth received his specimens) there is no species of *Zizyphus* corresponding to the characters of either: we may remark, that although Roth does so of all the other species he describes, he here takes no notice of the leaves being three-nerved.

II. BERCHEMIA. *Neck.; DC.*

Calyx 5-cleft, with a hemispherical tube; segments erect. Petals 5, convolute. Stamens inclosed within the petals. Anthers ovate, 2-celled. Disk fleshy, annular, flattish. Ovary half immersed in the disk but free from it, 2-celled. Style simple, short, 2-furrowed, bifid at the apex; stigmas convex. Fruit drupaceous, with a bony 2-celled nut. Seed-coat fibrous, closely adhering above and on the side next the axis to the putamen, free below and on the outer side.—Erect or climbing shrubs. Leaves alternate, many-nerved: nerves oblique, almost simple, pretty close to each other. Flowers in short corymbs or umbels from the axils of the upper leaves, or nearly sessile and fascicled along slender leafless branches which form a terminal panicle.

The fruit of two species only is known (*B. volubilis* and *B. floribunda*), so that the pinnately nerved leaves and ovary not cohering with the disk are the principal characters to distinguish this genus from *Zizyphus*. Some species have so much the habit of *Sageretia* (the fruit of which is totally unknown), that, independent of the disk (which is cup-shaped with an elevated border in *S. oppositifolia* and *S. theezans*, but perhaps differs in different species), the number of divisions of the style must be resorted to to separate them.

513. (1) B. *parviflora* (Wall.:) unarmed: leaves alternate and somewhat opposite, ovate-lanceolate, acuminated, sharply serrulated, somewhat coriaceous; upper side shining; nerves beneath and petioles pubescent: flowers sessile, fascicled, on long filiform panicled branches.—*Wall.! L. n.* 4258;

Digitized by Google

Wight! cat. n. 509.—Sageretia parviflora, *G. Don in Mill. dict.* 2. *p.* 29.—S. filiformis, *G. Don, l. c.*—Rhamnus parviflorus, *Klein! in Schult. syst.* 5. *p.* 295; *DC. prod.* 2. *p.* 28.—R. filiformis, *Roth, nov. sp. p.* 153; *DC. prod.* 2. *p.* 28; *Spr. syst.* 1. *p.* 769.

This has so much the habit of *Sageretia oppositifolia*, Brongn., that we only remove it to the present genus on account of the flat disk and 2-cleft style.

III. VENTILAGO. *Gærtn. fr. t.* 49.

Calyx spreading, 5-cleft. Petals 5, obovate, convolute. Stamens exserted: anthers ovate, 2-celled; the connectivum more or less produced beyond the anther into a gland-like point. Disk fleshy, flat. Ovary immersed in the disk, 2-celled. Style compressed, hairy, short, 2-toothed at the apex. Fruit indehiscent, woody, 1-celled, 1-seeded, produced upwards into an oblong membranaceous wing.—Large climbing shrubs with stiff branches. Leaves alternate, short-petioled, coriaceous, oblique at the base, feather-nerved, marked on the upper side with numerous striæform close transverse veins. Flowers pedicelled, fascicled on longish leafless branches that form a panicle.

514. (1) V. *maderaspatana* (Gærtn.:) leaves from orbicular to ovate-acuminated, acute or obtuse or cordate at the base, crenate-serrated or quite entire, glabrous or pubescent.—*Gærtn. fr.* 1. *p.* 223. *t.* 49; *Roxb. fl. Ind.* 1. *p.* 629; (*ed. Wall.*) 2. *p.* 413.—*Rumph. Amb.* 5. *t.* 2.—α; branches and leaves glabrous; flowers small; disk hairy only in the centre.—*Wight! cat. n.* 510.—V. maderaspatana, *DC. prod.* 2. *p.* 38; *Spr. syst.* 1. *p.* 781; *Roxb. Cor.* 1. *t.* 76.—V. bracteata, *Wall.! L. n.* 4269. *b* (and probably *a*).—β; leaves and branches pubescent when young, afterwards more or less glabrous; flowers larger; disk hairy all over.—*Wight! cat. n.* 510, 511.—V. maderaspatana, *Wall.! L. n.* 4268.—V. denticulata, *Willd.; DC. l. c.; Spr. l. c.*

Rumph's 5. t. 2. is usually quoted here, but, as Dr Wallich has observed, it is represented to climb by means of hooked prickles: this, however, is probably an addition of the engraver; the description stands thus: "rachides hinc inde crassas emittunt claviculas, quæ proximis sese implicant ramis, ac figunt, *nullæ* autem *spinæ* in hoc observantur fune:" in which the *claviculæ* mentioned are not prickles, as the engraver had understood the passage, but the fruit; as is obvious by the author saying, "flores fructusque in hoc vimine *nondum* fuere observati," although the fruit be very well figured by him.

IV. RHAMNUS. *Linn.; Lam. ill. t.* 128.

Calyx urceolate, 4-cleft. Petals either wanting; or 5, either nearly flat, or slightly convolute and emarginate at the apex. Stamens with ovate 2-celled anthers. Torus thin, lining the tube of the calyx. Ovary free from the calyx and not immersed in the torus, 2–3–4-celled. Styles 2–4, more or less connected or distinct. Fruit fleshy, containing 2–4 indehiscent cartilaginous nuts; one of them occasionally abortive.—Shrubs or small trees. Leaves alternate or rarely opposite, stipuled, short-stalked, feather-nerved.

515. (1) R. *Wightii* (W. & A.:) unarmed, glabrous, young parts turning black in drying: leaves opposite or nearly so, elliptical, with a short sudden acumination, slightly coriaceous, sharply and closely serrated: pedicels axillary, fascicled, scarcely longer than the flower, much shorter than the petiole: calyx 5-cleft: petals cuneate, obovate, obtuse with a short apiculus, flat: ovary 3–4 celled: styles 3–4, connected to the middle, then diverging: seeds with a deep furrow at the base on the outer side.—*Wight! cat. n.* 507.—Ceanothus Wightiana, *Wall.! L. n.* 4264.——Courtallum.

Digitized by Google

516. (2) R. *hirsuta* (W. & A.:) young branches pubescent, spinescent; older ones glabrous with a white cuticle: leaves ovate or alternate, ovate- or oblong-lanceolate, with a short sudden acumination, serrulated, membranaceous, nearly glabrous above, beneath hairy particularly on the nerves and veins: pedicels from the base of the young shoots, 3–6 together, pubescent, as long as the petiole: calyx 4-cleft: petals obovate, obtuse, entire, flat: ovary 2–3-celled: styles 2–3, connected to the middle, then diverging; the upper part jointed with and deciduous from the persistent lower half: fruit 2-celled: seeds plano-convex, with a deep furrow at the base on the outer convex side.—*Wight! cat. n.* 508.——Courtallum; not uncommon.

The flowers of these two species are apparently bisexual, but both belong to the section *Rhamnus* of Brongniart. The present has a very close affinity with *R. catharticus*, and still more with *R. virgatus*, Roxb. (Wall.! L. n. 4260), in which the leaves are pubescent when young, but almost glabrous when old, and the petals linear.

V. SCUTIA. *Comm.; Brongn.*

Calyx urceolate, 5-cleft; segments erect. Petals nearly flat, deeply emarginate or 2-lobed. Stamens short: anthers ovate, 2-celled. Torus fleshy, lining the tube of the calyx, closely surrounding the ovary, but not cohering with it. Ovary 2–3- or occasionally 4-celled. Style short, simple. Stigmas 2–3–4. Fruit 2–4- (but usually 3-) coccous, girt at the base by (but free from) the persistent entire tube of the calyx.—Glabrous shrubs. Leaves alternate, approximated by pairs, or nearly opposite, quite entire or only slightly serrulated, coriaceous, feather-nerved, 2-stipuled: stipules minute, deciduous. Spines (abortive branches) wanting, or curved, about equal in length to the petioles, arising from the axils of the lower leaves. Flowers axillary, disposed in few-flowered simple umbels scarcely longer than the petioles.

517. (1) S. *Indica* (Brongn.:) branchlets twiggy, slender, armed with somewhat opposite recurved prickles: leaves somewhat opposite, distant, not distichous, obovate, usually obtuse or retuse, sometimes acute, quite entire or slightly toothed towards the apex.—*Brongn. in Ann. sc. nat.* 10. *p.* 363; *Wight! cat. n.* 506.—Rhamnus circumscissus, *Linn.; Roxb. fl. Ind.* 1. *p.* 603; (*ed. Wall.*) 2. *p.* 350; *in E. I. C. mus. tab.* 1539.—R. myrtinus, *Burm. Ind. p.* 60 (an unarmed branch); *DC. prod.* 2. *p.* 27.—Ceanothus circumscissa, *Gærtn. fr.* 2. *t.* 106; *DC. prod.* 2. *p.* 30; *Spr. syst.* 1. *p.* 772; *Wall.! L. n.* 4266.—C. Zeylanica, *Heyne! in Roth, nov. sp. p.* 153; *DC. prod.* 2. *p.* 30; *Spr. syst.* 1. *p.* 772; *Wall.! L. n.* 4267.—Celastrus Zeylanica, *Roth, in Schult.; DC. prod.* 2. *p.* 9.—Catha Zeylanica, *G. Don in Mill. Dict.* 2. *p.* 10.—*Rheed. Mal.* 5. *t.* 30, 31.

Rhamnus lucidus, Roxb., and *Ceanothus circumscissa* β, D.C., are the same as *S. Commersonii*, Brongn., a species scarcely distinct from the present. Rheede's figures are neither of them good; he does not seem to have observed the thorns; but we have seen specimens with leaves as acute as in his *t.* 31.

VI. COLUBRINA. *Rich.; Brongn.*

Calyx spreading, 5-cleft: tube hemispherical. Petals 5, obovate, convolute. Stamens with ovate 2-celled anthers. Disk fleshy, rather flat, slightly 5-angled. Ovary immersed in and adhering to the disk, 3-celled. Style trifid. Stigmas 3. Fruit capsular, dehiscent, tricoccous, girt at the base by the adnate permanent entire tube of the calyx. Seeds furnished with a short stalk; testa coriaceous, very smooth.—Shrubs. Leaves alternate, feather-nerved;

Digitized by Google

nerves distant, reticulated with transverse veins. Flowers few, arranged in short axillary cymes.

518. (1) C. *Asiatica* (Brongn.:) erect, glabrous: leaves ovate, acuminated, obtuse or truncate and 3-nerved at the base, crenate-serrated, glabrous, shining: cymes about the length of the petioles, some of the flowers fertile, others sterile: petals convolute, emarginate, rather longer than the stamens. —*Brongn. in Ann. des sc. nat.* 10. *p.* 369; *Wight! cat. n.* 505.—Ceanothus Asiaticus, *Linn.; Lam. ill. t.* 129; *DC. prod.* 2. *p.* 30; *Spr. syst.* 1. *p.* 772; *Roxb.! fl. Ind.* 1. *p.* 615; (*ed Wall.*) 2. *p.* 373; *Wall.! L. n.* 4262.—C. capsularis, *Forst.; D.C. prod.* 2. *p.* 32; *Spr. syst.* 1. *p.* 772.—Pomaderris capsularis, *G. Don in Mill. dict.* 2. *p.* 39.—*Burm. Zeyl. t.* 48.

VII. VITMANNIA. *W. & A.* (not *Vahl.*)—Willemetia, *Brongn.* (not *Neck.; Cass.;* &c.)

Calyx urceolate; tube adnate to the ovary at the base, free above; limb 5-cleft, erect. Petals 5, cucullate; unguis scarcely any. Stamens at first inclosed within the petals: anthers ovate, 2-celled. Torus very thin, lining the tube of the calyx. Ovary half inferior, 3-celled. Style simple, 3-angled, 3-furrowed. Stigma 3-lobed.—A perfectly glabrous shrub, with erect branches. Leaves alternate, oblong-lanceolate, more or less obtuse, serrated, feather-nerved: stipules broad and short, recurved. Flowers small, white, arranged in few-flowered axillary or terminal cymes.

The *Willemetia* of Necker having been kept up by Cassini and Lessing, renders another name imperative. We have revived that of *Vitmannia*, the genus of that name instituted by Vahl being now ascertained to be the same with *Samadera* of Gærtner.

519. (1) V. *Africana* (W. & A.)—*Wight! cat. n.* 504.—Willemetia Africana, *Brongn. in Ann. des sc. nat.* 10. *p.* 371.—Ceanothus Africana, *Linn.; D.C.! prod.* 2. *p.* 32; *Spr. syst.* 1. *p.* 772.—*Pluk. t.* 126. *f.* 1.——Sent to Dr Wight by his collectors, but from what part of the Peninsula is uncertain.

VIII. GOUANIA. *Jacq.; Lam. ill. t.* 845.—Retinaria, *Gærtn. fr. t.* 120. *f.* 4.

Calyx 5-cleft; segments spreading. Petals 5, convolute or cucullate. Stamens 5, enclosed within the petals: anthers ovate, 2-celled. Disk concave or flattish, 5-angled, the angles opposite to the petals; the sides usually produced opposite to the calycine-segment, and forming a stellate disk, the accessory angles being either entire or 2-horned or truncated. Ovary connate with the bottom of the tube of the calyx, covered over by the disk, 3-celled. Style 3-fid. Fruit inferior, with 3 angles or keels or wings, consisting of 3 separable dry coriaceous compressed indehiscent carpels (*mericarps*), which are attached to a central tripartite filiform receptacle.—Usually climbing shrubs, with the branches often, from abortion, converted into tendrils. Leaves stipuled, alternate, feather-nerved, somewhat 3-nerved at the base from the lower nerves being largest and arched. Flowers usually fascicled on leafless branches, forming interrupted spikes or racemes, rarely umbellate or racemose in the axils of the upper leaves. Fruit as in the Umbelliferæ, but consisting of 3 instead of 2 mericarps.

520. (1) G. *leptostachya* (D.C.:) branches glabrous: leaves ovate, acuminated, slightly cordate at the base, coarsely crenate-serrated, glabrous: racemes interrupted, axillary or in terminal panicles, elongated, when young pubescent, afterwards glabrous: flowers on very short pedicels, polygamous:

Digitized by Google

disk glabrous, stellate; accessory angles partly adnate to the calycine lobes, free and acuminated towards the 2-horned apex: fruit glabrous, shortly winged.—*D.C. prod.* 2. *p.* 40; *Wall. L. n.* 4270; *Wight! cat. n.* 983.—G. tiliæfolia, *Roxb. Cor.* 1. *t.* 98; *fl. Ind.* 1. *p.* 632; (*ed Wall.*) 2. *p.* 417.——Circars.

This is, as far as we know, quite a northern species; that found in the middle and southern districts of the Peninsula being the following. Roxburgh, from his figure and description, could only have seen the very immature fruit; when completely ripe, it is about the size and shape of *Retinaria scandens*, Gærtn. fr. t. 120.

521. (2) G. *microcarpa* (D.C.:) young branches and racemes pubescent: leaves ovate or elliptical, acute or acuminated, slightly cordate at the base, almost quite entire, glabrous: racemes interrupted, axillary and terminal, elongated: flowers on very short pedicels, polygamous: disk densely pubescent, nearly orbicular from the accessary angles being truncated: fruit shortly winged, at first pubescent, afterwards glabrous.—*D.C. prod.* 2. *p.* 40; *Wall. L. n.* 4271; *Wight! cat. n.* 502.—G. tiliæfolia, *Heyne; Rottl.*——Courtallum. Middle and Southern Provinces.

When the fruit is unripe, being then triangular, and about the size of a pea, it accords well with De Candolle's character; but when quite ripe it increases to twice that size, and acquires three short thick wings. Lamarck's ill. t. 845. f. 1. *i*, *h*, is a good representation of it in that state, although intended for a different species.

ORDER LIV. TEREBINTHACEÆ. *Juss.*

Suborder 1. ANACARDIEÆ (*Br.**) Flowers usually unisexual. Calyx usually small, 5- (sometimes 3–4–7-) cleft; the fifth segment superior. Corolla regular. Petals equal in number to the divisions of the calyx (sometimes wanting), perigynous: æstivation imbricative or rarely valvular. Stamens equal in number to the petals and alternate with them, or twice as many or more: filaments distinct or cohering at the base, perigynous. Torus (in the free ovary) fleshy, usually discoid (annular or lobed or cup-shaped), or at first inconspicuous but afterwards enlarged into a gynophore. Ovarium solitary (of 1–5 carpels, distinct or united, but all abortive except one), free, or rarely adhering to the calyx, 1-celled (or sometimes with two additional abortive cells, the remains of the imperfect carpels): ovule solitary, attached to a podosperm which always arises from the base of the cell, but is frequently adnate to one of its sides to near the apex: styles usually 3 (or occasionally 4), rarely 5, usually distinct, very rarely combined: stigmas as many. Fruit 1-celled, indehiscent, usually drupaceous. Seed ascending, or more frequently pendulous. Albumen none. Radicle superior or inferior, next the hilum (very rarely at the opposite extremity), sometimes curved suddenly back: cotyledons thick and fleshy,

* The other suborders of Terebinthaceæ may be readily distinguished from each other by the following characters: 1. Anacardieæ has the ovary with only one perfect cell, and one ovule.—2. Spondieæ exhibits several cells in the ovary, with one ovule in each.—3. Burtereæ has the ovary with several cells, and two collateral suspended ovules in each.—The Amyrideæ must be removed from the group: they are all, we believe, American plants.

Digitized by Google

or leafy.—Trees or shrubs, with a resinous, gummy, caustic, or milky juice. Leaves alternate, not dotted, without stipules.

I. ANACARDIUM. *Rottb.*—Cassuvium, *Lam. ill. t.* 322.

Flowers polygamous. Calyx deeply 5-cleft, deciduous; segments erect: æstivation imbricative. Petals 5, linear, acuminated, recurved. Torus filling up nearly the whole tube of the calyx, and combining the bases of the stamens and petals. Stamens about 9 or 10, 1–4 of them in the male flowers fertile, and twice as long as the others, which are usually sterile: filaments connate at the base and with the base of the petals. Ovary free, sessile, oblique, 1-celled. Style solitary, somewhat on one side, filiform, curved. Fruit compressed, somewhat coriaceous, on the top of the enlarged elevated stalk-like pyriform torus: pericarp containing in its substance cells full of an acrid juice. Seed erect. Cotyledons semi-lunate, fleshy, plano-convex. Radicle curved upwards from the base of the cotyledons.—Trees. Leaves simple, entire and quite entire, feather-nerved, petioled. Panicle terminal, corymbose, branched, spreading. Flowers with bracteoles at the base of the pedicels, male and bisexual mixed together.

* 522. (1) A. *occidentale* (Linn.:) leaves oval, rounded or slightly emarginate at the apex, narrower but obtuse at the base: bracteoles broadly ovate, acuminated: one stamen longer than the others: fruit sessile on the apex of the torus, reniform.—*D.C. prod.* 2. *p.* 62; *Spr. syst.* 2. *p.* 271; *Roxb. fl. Ind.* 2. *p.* 312; *Wall.! L. n.* 990; *Wight! cat. n.* 524.—Acajuba occidentalis, *Gærtn. fr. t.* 40. *f.* 2.—Cassuvium pomiferum, *Lam.*—*Rheed. Mal.* 3. *t.* 54; *Rumph. Amb.* 1. *t.* 69.

II. SEMECARPUS. *Linn.*—Anacardium, *Lam. ill. t.* 208; *Gærtn. fr. t.* 40.

Flowers polygamous-dicœcious. Calyx 5-cleft. Petals 5, inserted under the margin of the disk, sessile, very spreading: æstivation imbricative. Stamens 5, inserted under the margin of the disk, equal, distinct. Torus a cup-shaped disk. Ovary free, sessile, 1-celled. Styles 3 from the apex of the ovary. Stigmas clavate, retuse. Fruit somewhat cordate, sessile on the enlarged elevated incrassated depressed or cup-shaped or turbinate torus; pericarp hard and thick, containing between the inner and outer lamina cells full of a corrosive resinous juice. Seed suspended. Cotyledons thick, fleshy, plano-convex. Radicle superior, minute, concealed within the apex of the cotyledons.—Trees. Leaves simple, entire and quite entire. Panicles terminal, branched, bracteolated.

523. (1) S. *Anacardium* (Linn.:) leaves cuneate-obovate, rounded at the apex, whitish beneath but scarcely downy: enlarged torus turbinate: fruit sessile, cordate-ovate, with a slight notch on one side under the apex.—*DC. prod.* 2. *p.* 62 (γ); *Spr. syst.* 1. *p.* 935; *Roxb. Cor.* 1. *t.* 12: *fl. Ind.* 2. *p.* 83; *Wight! cat. n.* 523.—S. cuneifolium, *Wall. L. n.* 986. *c.*—Anacardium latifolium, *Lam. enc. meth.* 1. *p.* 139; *ill. t.* 208. *fig. i, b.*—A. officinarum, *Gærtn.*

S. cuneifolium, Roxb., has the leaves tomentose beneath, and the nut with the one side nearly straight while the other is curved. Of it, Dr Roxburgh says that it is "a native of the range of mountains that bounds Hindostan on the north;" and adds, that the heat of Bengal is "too great for this species:" whence we have referred Wall. L. 986. *c* (from Heyne's herbarium), although we have not seen specimens, to *S. anacardium*, that species not being otherwise noticed in Wallich's List.

Digitized by Google

III. HOLIGARNA. *Roxb.*

Flowers polygamous-dicœcious. Calyx 5-toothed. Petals 5, from a broad base, contiguous, oblong, spreading. Stamens 5, shorter than the corolla. Ovarium (in the bisexual flowers) connate with the tube of the calyx, 1-celled, 1-ovuled: ovule suspended on one side from near the apex of the cell. Styles 1–3 from the top of the ovary. Fruit inferior, oval; pericarp thick, somewhat fleshy, containing between its lamina cells full of thick acrid juice. Seed with a transverse embryo. Cotyledons thick, broader than long: radicle from the broad side of the cotyledons, opposite to the hilum.—Trees. Leaves petioled, alternate, oblong, acute or acuminated, entire and quite entire, glabrous or when young with a short rusty-coloured pubescence.

524. (1) H. *longifolia* (Roxb.:) leaves cuneate, oblong or acute: petioles usually with a subulate soft incurved thorn-like deciduous process on each side about the middle: panicles terminal and axillary: styles recurved: stigmas lunate.—*Roxb. Cor.* 3. *t.* 282; *fl. Ind.* 2. *p.* 80; *DC. prod.* 2. *p.* 63; *Spr. syst.* 1. *p.* 935; *Wight! cat. n.* 525, 526.—*Rheed. Mal.* 4. *t.* 9.——Travancore. Malabar.

H. racemosa, Roxb., is distinguished by the leaves narrower, flowers racemose, one short style, and a capitate stigma.

IV. BUCHANANIA. *Roxb.*

Flowers bisexual. Calyx small, obtusely 5- (occasionally 3–4-) cleft, persistent. Petals 5, inserted under the disk, oblong, sessile, recurved. Stamens 10, inserted under the disk, shorter than the corolla, distinct, spreading. Disk orbicular, 10-crenated at the margin. Pistilla 5; four abortive, being mere styles; one fertile with a 1-celled 1-ovuled ovary immersed in the disk: ovule pendulous from a longish curved podosperm rising from the base of the cell. Style subulate. Stigma obtuse. Fruit a compressed ovoid-globose drupe: sarcocarp thin, slightly fleshy: nut very hard, 2-valved, 1-celled. Seed with a transverse embryo. Cotyledons thick.—Trees. Leaves alternate, simple, entire and quite entire. Panicles terminal and axillary towards the summit of the branches. Flowers small, greenish-white.

525. (1) B. *latifolia* (Roxb.:) leaves broadly oval or obovate, obtuse: branches of the panicles hirsute, with the flowers crowded.—*Roxb. fl. Ind.* 2. *p.* 385; *in E. I. C. mus. tab.* 103; *DC. prod.* 2. *p.* 64; *Wall.! L. n.* 983; *Wight! cat. n.* 527, 528.—Spondias elliptica, *Rottl.!*——Mountainous parts of the coast.

526. (2) B. *angustifolia* (Roxb.:) leaves linear-oblong, obtuse or emarginate: branches of the panicle glabrous, with the flowers lax.—*Roxb. Cor.* 3. *t.* 262; *fl. Ind.* 2. *p.* 386; *DC. prod.* 2. *p.* 64; *Spr. syst.* 2. *p.* 313; *Wall.! L. n.* 982; *Wight! cat. n.* 529, 530.—Cambessedea . . . . . *Kunth.*—Spondias simplicifolia, *Rottl.! in Willd. nov. ac. nat. cur. Ber.* 4. *p.* 87.—Mangifera axillaris, *Lam.*

V. MANGIFERA. *Linn.; Gærtn. fr. t.* 100; *Lam. ill. t.* 138.

Flowers polygamous. Calyx 5-partite, deciduous. Petals 4–5, inserted under the torus, furnished on the inside with a lobed glandular scale or crest: æstivation imbricative. Stamens arising from the torus: 1 (or occasionally 2) fertile, ascending, opposite to one of the lower sepals, with a subulate fleshy filament about as long as the style: the others sterile (usually 3 or 4, sometimes more), slender, minute, tipped with a small gland. Torus a thick

Digitized by Google

fleshy 4–5-lobed disk. Ovary with its base immersed in the torus, oblique, consisting of a solitary carpel, 1-celled, 1-ovuled: ovule attached a little above the base to the upper side of the ovary. Style 1, from the upper edge of the ovary, curved downwards. Stigma simple. Drupe somewhat compressed; sarcocarp fleshy; nut compressed, woody, 1-celled, 2-valved, covered on the outside with fibrous filaments. Seed solitary. Embryo between erect and transverse. Cotyledons thick, fleshy: radicle opposite to the hilum, curved slightly upwards.—Trees. Leaves alternate, coriaceous, entire and quite entire. Panicles terminal, much branched. Flowers small.

M. oppositifolia, Roxb., differs from this genus by having opposite leaves, 4–5 stamens all fertile, a short style composed of 3 combined, 3 stigmas, of which 2 are abortive and 1 fertile and much larger than the others, an evalvular nut, and erect embryo. To this we propose to apply the generic name of *Cambessedea*.

527. (1) M. *Indica* (Linn.:) leaves lanceolate, acuminated, glabrous, shining: panicles pubescent, erect: petals 5: fertile stamen arising from the inner side of the lobed disk: drupe obliquely oblong or somewhat reniform, obtuse, glabrous.—*DC. prod.* 2. *p.* 63; *Spr. syst.* 1. *p.* 17; *Roxb. fl. Ind.* 1. *p.* 641; (*ed Wall.*) 2. *p.* 435; *in E. I. C. mus. tab.* 69; *Wight! cat. n.* 541.—M. montana, *Heyne.*—M. domestica, *Gærtn.*—*Rheed. Mal.* 4. *t.* I, 2; *Rumph. Amb.* 1. *t.* 25, 61?

VI. SORINDEJA. *Pet.-Thouars.*

Flowers polygamous, dioecious. Calyx urceolate, with usually 5 obsolete acute teeth, persistent. Petals as many as the teeth of the calyx, inserted on the middle of the tube, sessile, oblong, spreading over the margin of the calyx: æstivation between valvular and imbricative. Torus a thin fleshy disk covering the bottom of the calyx.—MALE. Stamens 16–20 (or more), inserted without order on the surface of the disk: filaments very short: anthers oblong, bifid at the base and there fixed to the apex of the filaments. Rudiment of a pistil none.—BISEX. Stamens 10, inserted in a single series on the margins of the disk: filaments and anthers as in the male. Ovary conical, free, 1-celled: ovule solitary, pendulous from the apex of a podosperm arising from the base of the cell: style very short, thick. Stigma 3-lobed. Drupe somewhat compressed: nut covered with fibrous filaments. Embryo between inverted and transverse. Cotyledons thick, fleshy: radicle opposite to the hilum.—A tree. Leaves alternate, unequally pinnated. Panicles branched. Flowers small.

We find constantly 10 stamens in the bisexual flowers, not 5, as described by Kunth and De Candolle; the latter botanist, however, had not seen specimens, and the former appears to have taken his description principally from Du Petit Thouars. Brown mentions another species from the Congo, which we have not seen. *Condondum* of Rumph. Amb. l. t. 60. is referred here by Hamilton, but we are rather disposed to consider it the same as *Spondias dulcis*.

* 528. (1) S. *Madagascariensis* (DC.:) leaflets alternate or opposite, cuneate-oblong, retuse with a short blunt sudden acumination, glabrous, waved on the margin.—*DC. prod.* 2. *p.* 80; *Wight! cat. n.* 369.—Mangifera pinnata, *Lam. encycl. meth.* 3. *p.* 697 (not *Linn.*); *herb. Ham.!, and in Linn. Soc. Tr.* 13. *p.* 531.—Bursera acutifolia, *Sieb.! maur.* II. *n.* 288.

The specimens before us were from Klein's herbarium, and marked as gathered in the Missionaries' Garden in 1809. We do not know from whence the plant was obtained; probably from the Mauritius, where it has been for a long time cultivated in the Botanic Garden near Pomplemousse.

Digitized by Google

VII. SOLENOCARPUS. *W. & A.*

Flowers bisexual. Calyx small, 5-cleft, deciduous: segments rounded. Petals 5, oval, sessile, equal, inserted between the calyx and the disk: æstivation valvular. Stamens 10, inserted below the margin of the disk: filaments alternately shorter, nearly as long as the corolla: anthers elliptical. Torus a slightly concave entire disk, girding the base of the ovary. Ovary free, sessile, 1-celled: ovule solitary, pendulous from a short podosperm on one side near the apex of the cell. Style 1, thick, nearly as long as the stamens, furrowed longitudinally along the one side. Stigma oblique. Fruit (immature) somewhat reniform, hairy: pericarp with several (10 or fewer) longitudinal linear cells (*vittæ*) full of fragrant oil in its substance, 1-celled, 1-seeded. Seed pendulous from the apex of the convex side of the fruit.—A tree? Leaves fascicled at the extremities of the old branches and alternate on the young ones, on longish petioles, unequally pinnated: leaflets 5–7-pairs, elliptic-oblong, acuminated, slightly crenulated, glabrous, paler beneath; lateral nerves pellucid, uniting into one that is parallel and close to the margins. Panicles fascicled, from the apex of the branches.

We had some doubts whether this might not form a second species of *Pegia*, but so far as we can ascertain from Colebrooke's imperfect description, it must be distinct. In *Pegia* the calyx is persistent, and the fruit is globular: the foliage and the general appearance also appear to be different. In many points our genus resembles the following: both have considerable affinity with the *Burseraceæ*.

529. (1) S. *Indica* (W. & A.)—*Wight! cat. n.* 546, 547.——Courtallum.

VIII. ODINA. *Roxb.*

Polygamous. Calyx shortly 4-lobed, persistent, segments rounded. Petals 5, oblong, concave, spreading: æstivation imbricative. Stamens inserted below the margin of the disk: anthers ovate. Torus discoid, fleshy, 8-crenated, the crenatures alternating with the stamens. Rudimentary pistillum (in the male) 4-partite; segments erect, compressed, clavate. Ovary (in the bisexual flowers) free, oblong, 1-celled: ovule solitary, pendulous from one side near the apex of the cell. Styles 4, from the top of the ovary short, erect. Stigmas simple. Drupe reniform, glabrous, not compressed, very hard, 1-celled. Seed solitary, of the same shape as the nut. Embryo slightly curved, inverted. Cotyledons fleshy, flat.—Large trees. Leaves alternate, about the ends of the branches, unequally pinnated: leaflets 3–4-pair, opposite, almost sessile, oblong-ovate, acuminated, glabrous, quite entire, paler beneath. Racemes terminal, fascicled, interrupted, filiform and pendulous. Flowers small, fascicled.

530. (1) O. *wodier* (Roxb.)—*Roxb. fl. Ind.* 2. *p.* 293; *Wight! cat. n.* 542.

This is one of the most commonly cultivated and best known trees throughout the Peninsula, where, though far from being either ornamental or useful, its quickness of growth from cuttings recommends it; but we have been unable to detect any notice of it in European botanical works. Roxburgh does not mention the etymology: we know, however, that, in some of the southern districts, it is called *O-the-yin-poo-marum*, the first part of which may have suggested *Odina*. *Wodier* seems another native name; it is the *Wodur* of Dr Anderson's miscellanies.

Digitized by Google

IX. RHUS. *Linn.; Lam. ill. t.* 207.

Flowers polygamous or bisexual. Calyx small, 5-partite, persistent. Petals 5, ovate, patent, inserted under the margin of the disk: æstivation imbricative. Stamens 5, inserted into the disk, equal, free. Torus an orbicular disk. Ovary sessile, ovate or globose, 1-celled: ovule solitary, suspended from a longish curved podosperm rising from the base of the cell. Styles 3 from the top of the ovary, distinct or combined. Stigmas distinct, obtuse or capitate. Fruit almost a dry drupe: nut bony, 1-celled. Seed solitary, from a podosperm that rises from the base to the apex of the cell. Embryo inverted: cotyledons foliaceous: radicle opposite to the hilum, bent downwards along the margin of the cotyledons.—Shrubs or trees. Leaves alternate, simple or compound. Panicles axillary or terminal.

531. (1) R. (Sumac) *decipiens* (W. & A.:) leaves glabrous, unequally pinnated; rachis interruptedly winged, the portion between each leaflet tapering at the base and truncated at the apex; leaflets narrow-oblong or linear, tapering at the base, quite entire: panicles axillary, large, shorter than the leaves; branches angled, spreading horizontally: disk woolly: ovary ovate: style clavate, shortly 3-cleft at the apex.—*α*; leaflets narrow-oblong, about 6 or 8 pair.—*Wight! cat. n.* 520.—*Burm. zeyl. t.* 45.—*β*; leaflets linear-acuminated, about 12 pair.—*Wight! cat. n.* 521.——Southern provinces.

We fear that the characters of these varieties are not constant; we have only seen the flowers of our *α*. The same vernacular name, *Mail-nochye*, is applied to it that Leschenault and Jussieu gave to *Mallea Rothii*.

532. (2) R. (Sumac) *Mysurensis* (Heyne:) branches often spinescent; young ones, petioles, and panicles, densely pubescent: leaves palmately trifoliate; leaflets obovate, retuse, sinuate-lobed, villous beneath, lateral ones roundish, terminal one much the largest with a cuneate tapering base: panicles terminal or from the axils of the upper leaves, much longer than the leaves: disk concave, glabrous, with the stamens inserted under its margin: styles distinct, each with a capitate stigma: fruit globose.—*Heyne! in herb. E. I. C.; G. Don in Mill. dict.* 2. *p.* 74; *Wall.! L. n.* 997; *Wight! cat. n.* 519.—R. Indicum, *herb. Madr.!*——Mysore, *Heyne*.

Very closely allied to *R. parviflorum*, Roxb., but differing in several particulars.

Suborder 2. Spondieæ (*Kunth.*) **Flowers sometimes unisexual. Calyx 5-cleft, regular. Petals 5, equal: æstivation between valvate and imbricate. Stamens 10, perigynous, distinct. Torus large, discoid. Ovarium superior, sessile, 2–5-celled: ovules solitary, pendulous: styles 5, short: stigmas obtuse. Fruit drupaceous, 2–5-celled. Seed solitary in each cell. Albumen none. Radicle pointing to the hilum: cotyledons plano-convex.—Trees. Leaves imparipinnate, alternate, not dotted, exstipulate.**

X. SPONDIAS. *Linn.; Lam. ill. t.* 384; *Gærtn. fr. t.* 104.

Flowers bisexual, but often sterile. Calyx small, 5-cleft or toothed, deciduous. Petals 5, inserted under the margin of the disk, sessile, spreading: æstivation almost valvular. Stamens 10, inserted with the petals. Disk cup-shaped, with a crenulated elevated margin. Ovary free, sessile, 5-celled:

Digitized by Google

ovule solitary in each cell, suspended from near the apex of the axis. Styles 5, short and thick, distinct, rather distant at the base, conniving upwards. Drupe fleshy: nut 5- (or from abortion 1–3-) celled. Seeds solitary, pendulous. Embryo straight, inverted.—Trees. Leaves alternate, unequally pinnated, without dots. Panicles axillary and terminal. Flowers whitish or red. Fruit eatable.

In *S. lutea*, *mangifera*, and *dulcis*, the ovules are certainly solitary and suspended, notwithstanding what Gærtner thought he saw to the contrary: we have not seen *S. purpurea*. *S. dulcis* may perhaps form a distinct genus (*Cytheræa*), on account of the singular structure of the nut; there, from the axis not being prolonged while the cells are enlarged, not only does the nut become lobed, but the formerly pendulous ovules seem at length to form ascending seeds, with an inferior hilum and radicle. Blume, trusting to Gærtner's accuracy as to the number and position of the ovules, has separated all the Indian species which he found to have solitary ovules, and placed them in *Poupartia*; and amongst these *S. dulcis*, which he seems to consider as having a centrifugal radicle, while Gærtner represents it centripetal.

533. (1) S. *mangifera* (Pers.:) petiole terete: leaflets 4–5-pairs, ovate or elliptic-oblong, abruptly acuminated, oblique at the base, quite entire, veiny and glabrous: panicle diffuse: drupe oval (yellow): nut oblong, woody, very hard, outwardly slightly fibrous.—*DC. prod.* 2. *p.* 75; *Roxb. fl. Ind.* 2. *p.* 451; *Wight! cat. n.* 534.—S. amara, *Lam.; Spr. syst.* 2. *p.* 439.—S. Amra, *Ham. in Linn. Soc. Trans.* 13. *p.* 531.—S. paniculata, *Roxb. in E. I. C. mus. tab.* 50.—Mangifera pinnata, *Koen.; Linn. f. suppl. p.* 156 (not *Lam.*)—Poupartia mangifera, *Blume; G. Don in Mill. dict.* 2. *p.* 79.—*Rheed. Mal.* 1. *t.* 50; *Rumph. Amb.* 1. *t.* 61 ?

The *Condondum* of Rumph. Amb. 1. t. 60, which Hamilton (in Wern. Soc. Tr. 5. p. 359) seems disposed to refer to *Sorindeja*, we are rather inclined to consider the same with *S. dulcis*, Forst.

† 534. (2) S. *acuminata* (Roxb.:) petioles terete: leaflets 5–8 pair, nearly opposite, long-oval, acuminated, remotely crenulated, shining.—*Roxb. fl. Ind.* 2. *p.* 453.——Malabar.

With this we are quite unacquainted, and unfortunately Roxburgh does not furnish us with the details of the flower, ovary, or fruit, which, however, it is probable that he never saw. Supposing it not to be a *Spondias*, it may prove to be our *Solenocarpus Indica*.

Suborder 3. BURSEREÆ (*Kunth.*) **Flowers usually bisexual. Calyx persistent, somewhat regular, 2–5-divided. Petals 3–5, equal: æstivation usually valvular. Stamens two or four times as many as petals, distinct, perigynous. Torus orbicular. Ovarium 2–5-celled, superior, sessile: ovules in pairs, collateral, suspended: style one or none: stigma simple or lobed. Fruit rarely a hard capsule; usually drupaceous, 2–5-celled, its outer portion or sarcocarp often splitting into valves. Seed solitary. Albumen none. Radicle straight, superior, next the hilum: cotyledons fleshy, or wrinkled and plaited.—Trees or shrubs abounding in balsam, gum, or resin. Leaves alternate, usually not dotted, generally with stipules.**

Rumphia of Linnæus, apparently characterised solely from Rheede's figure and description (Mal. 4. t. 11), is usually referred to the *Terebinthaceæ*, and has more affinity with this suborder than with the others, on account of the 3-celled fruit. But even although we suppose the calyx to be tubular and trifid, with a 3-lobed bractea at its base, and the petals to be 3 and distinct, by which it would only differ from *Canarium* by having 3 stamens, yet the habit is totally different. Perhaps, however, each apparent stamen may be composed of several filaments, a structure which

Digitized by Google

might bring it nearer to the *Bytneriaceæ*. But it is by no means certain that the calyx is not connate with the ovary; and this, from Rheede's mode of expression, is very probable; in which case an affinity might exist with the *Alangieæ*. It has been also conjectured that the bractea may be the true calyx, and the apparent calyx a tube to the corolla, which would thus have 3 spreading segments. The plant has been seen, we believe, by no modern botanist: Rheede found it in "Parakaroo and other provinces of Malabar."

XI. BOSWELLIA. *Roxb.*

Flowers bisexual. Calyx small, 5-toothed, persistent. Petals 5, obovate-oblong, very patent, acute at the base, inserted under the margin of the disk: æstivation slightly imbricative. Stamens 10, inserted under the disk, alternately shorter: filaments subulate, persistent: anthers caducous. Torus a cup-shaped disk, fleshy, larger than the calyx, crenulated on the margin. Ovary oblong, sessile. Style 1, the length of the stamens, caducous. Stigma capitate, 3-lobed. Fruit capsular, 3-angled, 3-celled, 3-valved, septicidal: valves hard. Seeds solitary in each cell, surrounded by a broad membranaceous wing. Cotyledons intricately folded, multifid.—Trees producing balsam and resin. Leaves deciduous, alternate towards the top of the branches, unequally pinnated: leaflets opposite, serrated. Stipules none. Racemes terminal or axillary. Flowers on short pedicels, white.

Although we describe this in conformity to other botanists as a capsule, it is in reality a modification of a drupe, the coriaceous sarcocarp splitting at the angles into valves, which remove with them the endocarp or nuts, each containing a single seed.

535. (1) B. *glabra* (Roxb.:) leaflets broadly-lanceolate, obtuse, serrated, glabrous: racemes simple, terminal, fascicled, shorter than the leaves.—*Roxb. Cor.* 3. *t.* 207; *fl. Ind.* 2. *p.* 384; *DC. prod.* 2. *p.* 76.——Mountainous districts of Coromandel.

In the specimen which we have seen (in Hamilton's herbarium) from the Calcutta Botanic Garden, marked however "*B. thurifera*, Colebr," the leaflets are glabrous, oblong, quite obtuse, and distinctly crenate-serrated: Roxburgh says they are sometimes quite entire; he also quotes *Canarium balsamiferum*, Willd. (Rumph. Amb. 2. t. 50) which has acuminated entire leaves, but which is, according to Rumph's description, a true *Canarium*.

536. (2) B. *thurifera* (Colebr.:) leaflets oblong, obtuse, serrated, pubescent: racemes axillary, single, shorter than the leaves.—*Colebrooke in As. res.* 9. *p.* 377; *Roxb. fl. Ind.* 2. *p.* 383.——Mountainous parts of Coromandel.

We dare not quote here *B. serrata*, Stackh. extr. Bruc. p. 19. t. 3, the leaves being usually described as ovate-oblong and acuminated: nor, for the same reason, can we refer, with Roxburgh, to Rumph Amb. 2. t. 51, the *Canarium hirsutum*, Willd., or *Bosw. hirsuta*, Sm. The different species require however to be re-examined, in order to obtain better specific characters.

XII. CANARIUM. *Linn.; Gærtn. fr. t.* 102.

Flowers polygamous-dicecious. Calyx campanulate, 3-lobed; lobes unequal. Petals 3, inserted under the disk, twice as long as the calyx, oblong, concave: æstivation imbricative. Stamens 6, inserted under the disk, shorter than the petals, unequal. Torus an urceolate disk, at the bottom of the calyx. Ovary sessile, ovate-globose, 3-celled. Style very short, or wanting. Stigma 3-lobed. Fruit a drupe: sarcocarp thin, somewhat fleshy: nut very hard, 3-angled, 3-celled (two of the cells often abortive). Seed solitary in each perfect cell. Cotyledons intricately folded, deeply 3-cleft.—Trees.

Digitized by Google

Leaves unequally pinnated, upper ones with large deciduous stipules. Flowers panicled, bracteolated.

C.? Sajiga, Ham.! (herb. n. 614) is *Turpinia pomifera*, DC.

537. (1) C. *commune* (Linn.:) stipules oval, inserted at the base of the common petiole: leaflets 7–11, on long stalks, ovate-oblong, acute or shortly acuminated, quite entire, glabrous: panicle terminal, divaricated; flowers 2–3 together, almost sessile at the extremity of the ultimate pedicels, before expanding enclosed in thin broadly ovate concave silky bracteoles: calyx externally silky: nut with 1–2 cells (usually) abortive.—*Kon. in ann. bot.* 1. *p.* 260. *t.* 7. *f.* 2; *DC. prod.* 2. *p.* 79; *Spr. syst.* 2. *p.* 125; *Roxb. fl. Ind.* 3. *p.* 137; *Wight! cat. n.* 387, 535, 536.—C. mehenbethene, *Gærtn. fr.* 2. *t.* 102?—Amyris Zeylanica, *Retz, obs.* 4. *p.* 25; *Spr. syst.* 2. *p.* 218.—Balsamodendron Zeylanicum, *Kunth; DC. prod.* 2. *p.* 76.—Colophonia Mauritiana, *DC. prod.* 2. *p.* 79.—Bursera paniculata, *Lam. encycl. meth.* 2. *p.* 768; *Spr. syst.* 2. *p.* 313.—*Rumph. Amb.* 2. *t.* 47, 48?

Konig states that, in the wild plant, the nut has three cells, but when cultivated two of them generally disappear; this may explain the difference between Gærtner's figure and those of Konig and Rumph; but we incline to suspect that what Gærtner has figured belongs to Rumph's t. 48, and that it constitutes a different species.

538. (2) C. *strictum* (Roxb.:) young parts densely clothed with rusty coloured short pubescence: stipules subulate: leaflets 9–15, stalked, ovate or ovate-lanceolate, acuminated, at length serrulate-ciliate, hairy.—*Roxb. fl. Ind.* 3. *p.* 138.——Tinevelly.

Introduced into the Botanic Garden of Calcutta, where it does not appear to have flowered. We consider it a very doubtful species. The leaves are described to be 3–4 feet long; and the leaflets about a foot, by six inches broad.

XIII. GARUGA. *Roxb.*

Flowers bisexual. Calyx campanulate, 5-furrowed, 5-cleft: segments erect. Petals 5, linear, inserted into the mouth of the calyx between its lobes, and under the margins of the divisions of the torus: æstivation valvular, with the margin curved in. Stamens 10, about equal, 5 inserted with the petals, 5 at the base of the calycine segments: filaments hairy at the base. Torus thin, fleshy, 5-cleft; divisions closely adhering to the calyx, opposite to its segments; each with an obtusely almost glandular emarginate apex (resembling a gland placed on each side of every petal). Ovary sessile, ovate, 5-celled: style thick, about as long as the petals. Stigma 5-lobed. Drupe globose, fleshy, with from 1–5 one-seeded nuts.—Large trees. Leaves unequally pinnated: leaflets nearly sessile, crenate-serrated. Flowers panicled.

Although unnoticed by De Candolle, the torus or disk is very conspicuous, lining the tube of the calyx. The stamens that alternate with the petals, although apparently unconnected with the torus, yet in reality must be attached to a thin lamina of it, expanded between the darker coloured divisions, to which alone in the above character we have applied the term. We do not understand what De Candolle means by saying, that there are 5 glands, one between every pair of stamens: had he meant the bifid extremities of the divisions of the torus, he must have described 10 glands, alternate with the stamens, or a pair between every petal.

539. (1) G. *pinnata* (Roxb.)—*Roxb. Cor.* 3. *t.* 208; *fl. Ind.* 2. *p.* 400; *DC. prod.* 2. *p.* 80; *Spr. syst.* 2. *p.* 313.—G. Madagascariensis, *DC.? l. c.*—*Rheed. Mal.* 4. *t.* 33.

Hamilton, in his herbarium, now belonging to the University of Edinburgh, remarks that the leaves are villous or glabrous on the same tree: whence we cannot separate the Madagascar plant from the Malabar and Bengal one.

Digitized by Google

XIV. PROTIUM. *Burm.*

Flowers polygamous. Calyx campanulate, 4-toothed, persistent. Petals 4, linear-oblong, inserted under the margin of the torus: æstivation valvular, the margin curved in. Stamens 8, shorter than the corolla, glabrous, inserted under the margin of the torus. Torus cup-shaped, fleshy, deeply crenated. Ovary sessile, 2-celled: ovules 2 in each cell, collateral, suspended from the middle of the axis. Style very short: stigma obtuse, 4-lobed. Drupe globose or ovate; nut thick and very hard, bony, 2-celled (one of the cells by abortion often obliterated), at length divisible into two nuts. Seed solitary in each perfect cell.—Trees giving out balsam. Leaves unequally pinnated: leaflets 3–7, without dots.

We have never seen the parts of the flower in a quinary proportion, but Kunth seems to have sometimes observed this, if his *Protium* be indeed the same. Future observations on the living plants may prove, that there are not more than two distinct species of the genus, corresponding to our two sections, but the specimens before us present a considerable difference of habit.

§ 1. *Calyx tubular-campanulate, 4-angled: stamens, 4 inserted on the back of the crenatures of the torus, 4 inserted with the petals under its clefts between the crenatures: torus 4-crenated, lining the tube of the calyx halfway up: drupe globose: sarcocarp thick, splitting into 4 valves: nut globose.—Leaflets 3–7, acuminated, all stalked: flowers few, in lax panicles.*—Protium, *Burm.*

540. (1) P. *caudatum* (W. & A.:) branches not spinescent: leaves unequally pinnated; leaflets 1–2 pairs, petiolate, ovate-lanceolate with a long fine sharp acumination, quite entire, glabrous: panicles fascicled, supra-axillary, from the young shoots of the season, equal to or exceeding the length of the young leaves, shorter than the adult ones, 2–3 times dichotomous, lax.—*Wight! cat. n.* 552.

541. (2) P. *Roxburghiana* (W. & A.:) branches not spinescent: leaves unequally pinnated; leaflets 1–3 pairs, shortly petioled, oval, sometimes acute at the base, ending in a short abrupt often obtuse point, quite entire, glabrous: panicles from the ends of the last year's shoots, usually shorter than the petioles, dichotomous, lax.—*Wight! cat. n.* 548, 549, 550.—Amyris acuminata, *Roxb.? fl. Ind.* 2. *p.* 246; *in E. I. C. mus. tab.* 1831.

So far as we can judge from the specimens before us, this may be distinguished from the last by the want of the long tapering point to the leaf. The peduncles in the present, arise "from the base of the tender shoots below the young leaves," as Roxburgh describes in his plant from the Moluccas, and not from the "tender shoots" themselves, a little above the axils of the young leaves; on which account we refer Roxburgh's *Am. acuminata* here instead of to *P. caudatum*. At page 96 of this work we mentioned that this would form a new genus next to *Protium*; we then meant the genus according to the character given by Kunth and De Candolle, from which ours above differs considerably.

542. (3) P. *pubescens* (W. & A.:) branches not spinescent: leaves unequally pinnated; leaflets usually 3 pairs, nearly sessile, roundish ovate, with a short obtuse acumination, quite entire, densely pubescent on the under side: panicles (in fruit) rather longer than the petioles, 2–3 times dichotomous, lax.—*Wight! cat. n.* 551.

§ 2.? *Calyx short, broadly campanulate* (Vahl): *torus 8-crenated, the crenatures resembling glands, alternate with the stamens* (Kunth): *drupe ovate, pointed: nut 4-angled.—Leaflets 3, or occasionally 5, sessile: peduncles*

Digitized by Google

terminal on very short branchlets, dichotomous, or 1-flowered and either solitary or aggregated.——Balsamodendron, *Kunth.*

543. (4) P. *Gileadense* (W. & A.:) ultimate branches short, patent, spinescent, with small very short abortive branchlets, bearing at their extremities the leaves and flowers: leaves palmately 3-foliolate; leaflets roundish obovate, obtuse, obscurely crenulate, glabrous: peduncles 1-flowered, shorter than the petioles—*Wight! cat. n.* 543.—Balsamodendron Gileadense, *DC. prod.* 2. *p.* 76.—Amyris Gileadensis, *Linn.; Roxb. fl. Ind.* 2. *p.* 246; *Spr. syst.* 2. *p.* 217; *Vahl, symb.* 1. *t.* 11.—A. spinosa, *herb. Madr.!*

We have no means of ascertaining whether the other species referred to *Balsamodendron* by Kunth and De Candolle be distinct, or be only varieties.

XV. ICICA. *Aubl.*

Calyx small, obtusely 5-toothed. Petals 5, inserted under the disk, recurved, sessile: æstivation valvular. Stamens 10, inserted with the petals, and shorter than them. Torus cup-shaped, 10-crenated at the margin. Ovary free, sessile, 5-celled: ovules 2 in each cell, collateral, pendulous from the upper part of the axis. Style very short. Stigma 5-angled. Drupe globose, obtuse, 1–3-celled, the dissepiments (when present) thick and fleshy; sarcocarp coriaceous, splitting into valves: nuts (seeds?) bony, very hard, solitary in each cell, covered with an adhering arilliform fibrous pulp, marked externally with a depression or hilum, swollen internally opposite to the hilum or point of attachment of the placenta. Cotyledons foliaceous, thin, intricately folded and chrysaloid: radicle superior, cylindrical, thick.—Trees, producing resin or balsam. Leaves unequally pinnated, not dotted. Stipules none. Racemes or panicles axillary. Flowers small, white, or yellowish green.

In the above character we have had the East Indian species alone in view, but there is no difference between it and the genus as defined by Kunth, except the slight addition by him for the reception of such as have the flowers divided in a quaternary manner.

544. (1) I. *Indica* (W. & A.:) young shoots, petioles, pedicels and calyx pubescent: leaflets 7–11, petioled, oblong-lanceolate, with a sudden short obtuse acumination, more or less serrulated, from almost glabrous to densely pubescent: panicles axillary, solitary, lax, narrow (racemiform), much shorter than the leaves: stamens 10: fruit-bearing peduncle thickened.—*Wight! cat. n.* 985.—Bursera serrata, *Wall.; Colebr. in Linn. soc. trans.* 15. *p.* 362. *t.* 4; *G. Don in Mill. dict.* 2. *p.* 84.—Schinus Benghalensis, *herb. Ham.!*—S. saheria, *herb. Ham.!*—S. Niara, *herb. Ham.!*

ORDER LV.—MORINGEÆ. *R. Brown.*

Calyx 5-partite: æstivation slightly imbricated. Petals 5, nearly equal, the upper one ascending. Stamens perigynous: filaments 10, flat, and hairy at the base: anthers 8 or 10, peltate, simple, 1-celled, with a thick convex connectivum. Torus fleshy, lining the tube of the calyx. Ovarium free, stipitate, 1-celled: style filiform, terminal, not obliquely inserted: stigma simple. Placentæ three, parietal. Fruit a pod-like capsule, 1-celled, 3-valved, loculicide. Seeds numerous, half-buried in the fungous substance of the valves. Albumen none. Ra-

Digitized by Google

dicle straight, small: cotyledons fleshy, plano-convex.—Leaves twice or thrice pinnate, with an odd leaflet. Racemes panicled.

MORINGA. *Juss.; Lam. ill. t.* 337.

Character the same as that of the order.

545. (1) M. *pterygosperma* (Gærtn.:) 5 stamens without anthers: capsules triquetrous: seeds 3-angled, the angles expanding into wings.—*Gærtn. fr.* 2. *p.* 314. *t.* 147; *DC. prod.* 2. *p.* 478; *Wall.! L. n.* 5814; *Wight! cat. n.* 632.—M. oleifera, *Lam. encycl. Meth.* 1. *p.* 398.—M. Zeylanica, *Pers. syn.* 1. *p.* 460.—Guilandina Moringa, *Linn. sp. p.* 546; *Roxb. in E. I. C. mus. t.* 58.—Hyperanthera Moringa, *Vahl, symb.* 1. *p.* 30; *Spr. syst.* 2. *p.* 327; *Roxb. fl. Ind.* 2. *p.* 368.—Anoma Moringa, *Lour.—Rheed. Mal.* 6. *t.* 11; *Rumph. Amb.* 1. *t.* 74.

*546. (2) M. *polygona* (DC.:) all the stamens bearing anthers: capsules many-angled: seeds 3-angled, the angles expanding into wings.—*DC. prod.* 2. *p.* 478.—Hyperanthera decandra, *Willd. sp. p.* 535; *Spr. syst.* 2. *p.* 327.—Anoma Moringa *Lour.—Burm. Zeyl. t.* 75; *Rumph. Amb.* 1. *t.* 75.

Perhaps a mere variety of the last; we have never seen specimens of it.

ORDER LVI.—LEGUMINOSÆ. *Juss.*

Calyx 5-parted, or toothed, or cleft, with the odd segment anterior; segments often unequal, and variously combined. Petals 5 (or, from abortion, 4, 3, 2, 1, or wanting), inserted into the base or upon the tube of the calyx, usually unequal, sometimes variously combined; the odd petal superior. Stamens definite or indefinite, inserted with the petals, or sometimes hypogynous, distinct, or monadelphous, or diadelphous, or rarely triadelphous: anthers bilocular, versatile. Ovaria free from the calyx, 1-celled, almost always solitary, very rarely 2–5: ovules solitary or several: style simple, proceeding from the upper or ventral suture: stigma simple. Fruit a legume or drupe. Seeds solitary or several, sometimes with an arillus or large carunculus. Albumen none. Embryo straight or with the radicle bent back along the edge of the cotyledons: cotyledons thin and nearly foliaceous, or thick and fleshy.—Leaves alternate, usually trifoliate or pinnated, sometimes reduced to a solitary leaflet, with usually stipules at the base of the petiole, and at the base of each leaflet. Pedicels usually jointed.

The fleshy or foliaceous cotyledons in this order can frequently be scarcely distinguished before germination commences: when that process begins, the one kind remains thick and fleshy, as in the common garden bean or pea; while the other becomes more thin and foliaceous, resembling almost the leaves of the plant. We have followed De Candolle pretty closely in his arrangement of the genera, although, it must be allowed, the characters of the subtribes and their divisions are not yet very well defined.

TRIBE I.—PAPILIONACEÆ. *Linn.; DC.*

Sepals imbricated or slightly valvate in æstivation. Corolla papilionaceous, irregular, and with the stamens inserted into the bottom of the calyx, or perigynous. Embryo with the radicle bent back on the

Digitized by Google

edge of the cotyledons.—Leaves simple or simply compound, never twice or thrice pinnated.

SUBTRIBE I.—SOPHOREÆ. *Spr.*

Stamens distinct. Legumen without joints. Cotyledons flat, foliaceous during germination.

I. SOPHORA. *Linn.; R. Brown; Lam. ill. t. 325. f. 2.*

Calyx 5-toothed, campanulate, or somewhat attenuated at the base. Petals of the keel usually combined at their apex. Legumen moniliform, not winged, several-seeded.—Trees, shrubs, or herbaceous plants. Leaves irregularly pinnated, often without stipules. Racemes terminal, simple or panicled.

547. (1) S. *glauca* (Lesch.:) shrubby: leaflets 19–23, elliptical, mucronate, upper side glaucous and velvety, under villous: racemes terminal, crowded. —*DC. prod.* 2. *p.* 95; *Spr. syst. suppl. p.* 170; *Wall.! L. n.* 5334; *Wight! cat. n.* 634.——Neelgherries.

*548. (2) S. *tomentosa* (Linn.:) arborescent: leaflets 15–19, oval-roundish, very obtuse, covered on both sides as well as the calyx with hoary tomentum: racemes terminal, elongated.—*Linn. sp. p.* 533; *DC. prod.* 2. *p.* 95; *Spr. syst.* 2. *p.* 346: *Lam. ill. t.* 325, *f.* 2; *Roxb. fl. Ind.* 2. *p.* 316; *in E. I. C. mus. tab.* 1416; *Wall.! L. n.* 5333.—S. occidentalis, *Linn. sp. p.* 533.—*Rumph. Amb.* 4. *t.* 22.

Rumph's figure is bad, in as far as he represents many of the leaflets acute; but his description is accurate.

II. VIRGILIA. *Lam. ill. t.* 326.

Calyx unequally 5-cleft, somewhat bilabiate. Corolla papilionaceous; petals about equal: vexillum with the margins not bent back. Stamens quite distinct, or shortly united at the base. Stigma beardless. Legume compressed, oblong-linear, several-seeded.—Trees or shrubs. Leaves unequally pinnated. Flowers racemose.

We adopt this genus as left by De Candolle, but we must remark that it contains the types of several distinct ones. That to which *V. capensis* belongs has the stamens quite distinct at the base; the keel rostrate as in *Crotalaria*, and its petals combined at the back from the middle to the apex. *V. lutea* has been separated by Rafinesque under the name *Cladrastis lutea*. *V. intrusa* Br. (with which *V. sylvatica*, Burch., is the same), and *V. aurea*, Lam., forms a third group or genus, having the stamens persistent and shortly combined at the base, the keel obtuse and of two petals, the legume compressed, with a narrow wing or margin along its seminiferous suture, and its valves closely cohering with each other between the seeds.

549. (1) V. *aurea* (Lam.:) young shoots slightly pubescent: leaflets about 9 or 10 pairs, oval, obtuse, nearly glabrous, usually quite opposite: upper lip of the calyx obtusely 2-lobed; segments of the lower ovate, acutish: keel-petals overlapping at the lower margin, distinct: stamens persistent, 9 shortly connected at the very base, the tenth quite distinct: ovary tomentose: legumes glabrous.—*Lam. ill. t.* 326. *f.* 1; *DC. prod.* 3. *p.* 98; *Spr. syst.* 2. *p.* 348; *Wight! cat. n.* 999.—Robinia subdecandra, *L'herit. st. nov. t.* 75.—R. Heynei, *Wall.! L. n.* 5653.—Podalyria aurea, *Willd. sp.* 2. *p.* 502.—Courtallum.

We can see no difference whatever between the Indian plant and specimens before us from European gardens, except that the flowers of the latter are rather larger and of a deeper yellow.

Digitized by Google

SUBTRIBE II.—LOTEÆ. *DC.*

Stamens either all united (monadelphous), or nine united and one distinct (diadelphous). Legume not jointed, 1-celled, or rarely 2-celled from the one suture being introflexed. Cotyledons flattish, foliaceous during germination.

A. *Stems usually shrubby: leaves simple or palmately trifoliolate, rarely pinnated: stamens almost always monadelphous: legume* 1-*celled.*—Genisteæ, *Brown.*

III. HEYLANDIA. *DC.*

Calyx 5-cleft, lobes nearly equal. Corolla papilionaceous: keel obliquely truncated, acuminated. Stamens monadelphous; the sheath cleft in front. Style filiform, bent so as to form nearly a right angle. Legume compressed, 1-celled, 1-2-seeded. — Herbaceous or shrubby plants, hairy, dichotomous, without stipules. Leaves on short petioles, obliquely cordate-ovate or cordate-roundish. Flowers axillary, solitary, nearly sessile, yellow, small. Legumes more or less hairy.

550. (1) H. *latebrosa* (DC.)—*DC. mem. Leg. p.* 201 *; prod.* 2. *p.* 123 ; *Spr. syst. suppl. p.* 267 ; *Wight ! cat. n.* 838.—H. hebecarpa, *DC. mem. Leg. p.* 200. *t.* 34 ; *prod. l. c.* ; *Spr. l. c. p.* 266.—H. leiocarpa, *DC. mem. Leg. p.* 200 ; *prod. l. c ; Spr. l. c.; Wall.! L. n.* 5342.—Hallia hirta, *Willd. sp.* 3. *p.* 169.—H. monophylla, *Desv.*—Hedysarum latebrosum, *Linn. mant. p.* 270.—Crotalaria uniflora, *Koen.; Roxb. fl. Ind.* 3. *p.* 271 ; *in E. I. C. mus. tab.* 365.—*Pluk. t.* 454. *f.* 8.

We have presumed to combine the three species proposed by De Candolle, because they seem rather states of the same plant, arising partly from difference of age: indeed we have observed the legumes to vary from glabrous to very hairy on the same specimen: had De Candolle seen a variety of specimens instead of one or two only of each, he would have probably been of the same opinion.

IV. CROTALARIA. *Linn.; Gærtn. fr.* 2. *t.* 148 *; Lam. ill. t.* 617.

Calyx 5-lobed, somewhat 2-lipped; the upper lip 2-, the lower 3-cleft. Corolla: vexillum large, cordate, with scales or callosities at the base: keel falcate, usually tapering to a point, more rarely obtuse. Filaments all united; sheath usually cleft in its upper part. Legumes turgid: valves ventricose, inflated. Seeds compressed, reniform, usually several. — Herbaceous or shrubby plants. Stipules and bracteas sometimes minute or wanting, sometimes large. Leaves simple or palmately compound, with 3–5–7 leaflets. Flowers usually yellow.

We omit here *C. incana*, Linn., Wight ! cat. n. 709, a species certainly only cultivated in India, and from which *C. affinis*, DC. (a plant said to be from the Mauritius but probably not indigenous there) does not appear to differ. We also pass over *C. Brownei*, Bertero !, DC. !, Wight ! cat. n. 708, our specimens having been raised in the Missionaries' Garden from seeds sent to them by Mr Moon from Ceylon; it is the "*C. latifolia*, Roxb.," of his catalogue of Ceylon plants, erroneously said to be a native of India. We learn from Dr Graham that specimens have been received by him under that name from the Calcutta Botanic Garden, but it is not in Wallich's Catalogue, nor in Roxburgh's *Hortus Benghalensis*: it is, however, the *C. lanceolata* of the latter work. When without fruit it might at first sight be taken for a large specimen of *C. cytisoides*, Roxb. (*Priotropis cytisoides*, W. & A.), which however differs widely in its carpological characters, having a legume elliptic, quite flat, slightly stalked, acuminated at the apex and terminated by the straight base of the style. We do not know the *C. striata*, DC., nor from what part of India Leschenault obtained it: no character is given sufficient to enable us to recognise it.

Digitized by Google

a. *Leaves simple, sessile or shortly petioled.*

§ 1. Stipules decurrent: leaves simple: racemes few-flowered, lateral, springing from the branch a little below the leaves, and on the opposite side: legume oblong, many-seeded.—*Alatæ.*

551. (1) C. *rubiginosa* (Willd.:) low, shrubby, branched, diffuse, slender, densely pubescent: stipules triangular at the apex, decurrent: leaves simple, from elliptic-oblong to roundish, mucronate, slightly tomentose and glaucous beneath: racemes lateral: legume sessile, about twice the length of the calyx.—*Willd. sp.* 3. *p.* 973; *DC. prod.* 2. *p.* 125; *Spr. syst.* 3. *p.* 238—*α*; leaves roundish.—*Wight! cat. n.* 691.—C. Wightiana, *Wall.! L. n.* 5358. *b.*—*β*; leaves oblong, slightly pointed.—*Wight! cat. n.* 689.—*γ*; leaves oblong, obtuse, small.—*Wight! cat. n.* 690.—C. ovalifolia, *Wall.! L. n.* 5411.——Neelgherries. Dindygul.

Our variety *γ* formed thick tufts on the summit of a hill near Dindygul, at an elevation of about 4000 feet.

552. (2) C. *scabrella* (W. & A.:) procumbent, elongated, rigid, covered all over with a dense harsh pubescence: branches elongated, simple, straight: stipules triangular at the apex, with an acuminated rigid recurved point: leaves oval, mucronate, slightly coriaceous, somewhat tomentose and glaucous on the under side: racemes lateral: legumes shortly stalked, 4–5 times longer than the calyx, glabrous.—*Wight! cat. n.* 692.

553. (3) C. *Wightiana* (Graham:) tall, erect, branched, clothed with close-pressed shortish rusty-coloured shining hairs: stipules triangular-ovate at the apex, mucronate: leaves elliptic-obovate, obtuse, mucronate: racemes lateral: legumes shortly stalked, 2–3 times the length of the calyx, glabrous.—*Wall.! L. n.* 5358. *a*; *Wight! cat. n.* 693.——Dindygul hills, at an elevation of 3500 feet.

This and the other Indian species of the section are all mountainous plants.

§ 2. Stipules not decurrent: leaves simple: flowers racemose: calyx large, about equal to the corolla, densely shaggy as well as the bracteas with long dark coloured hairs, cleft nearly to the base; segments with their margins flat: vexillum glabrous, or with a line of hairs: legumes oblong, glabrous, many-seeded.—*Calycinæ.*

554. (4) C. *anthylloides* (Lam.:) annual, erect, all clothed except the upper side of the leaves with close-pressed brownish hairs: stipules minute, setaceous: leaves from oblong to oblong-linear or somewhat lanceolate, usually glabrous, but sometimes with a few scattered hairs on the upper side: flowers axillary and solitary, and in terminal racemes: calyx permanent, deeply 5-cleft, very hairy, longer than the corolla: segments straight: legume glabrous, sessile, broader upwards, shorter than the calyx.—*Lam. enc. meth.* 2. *p.* 195. (descr. good); *Herb. Smith!*; *Don. prod. fl. Nep. p.* 241; *DC. prod.* 2. *p.* 129; *Spr. syst.* 3. *p.* 239; *Wight! cat. n.* 683.—C. stricta, *Roxb.! fl. Ind.* 3. *p.* 265; *in E. I. C. mus. t.* 369.—C. Roxburghiana, *DC. l. c.*; *Spr. l. c.*; *Wall.! L. n.* 5364.—C. crenata, *Wall.! L. n.* 5408.—C. linearis, *Wall.! L. n.* 5370.—C. calycina, *Schrank*; *DC. l. c.* (excl. syn.).—C. Napalensis, *Link?*; *DC.? l. c.*; *Spr.? l. c. p.* 238.

This species has a most wide range in India: it extends from Ceylon to Java, Canton-China, and Nepal: the breadth of the leaves is variable, in some specimens being narrow-linear, in others almost oval; the upper surface is usually quite glabrous, but occasionally sprinkled with hairs.

555. (5) C. *barbata* (Graham:) herbaceous, erect, densely clothed with dark brown hairs: stipules minute, inconspicuous: leaves oblong-lanceolate, bluntish; racemes terminal, elongated; flowers few, distant: calyx a little shorter than the corolla, deeply 5-cleft, very hairy; segments slightly falcate:

Digitized by Google

legume glabrous, stalked, 2–3 times the length of the calyx, obovoid: apex of the style and stigma woolly.—*Wall.! L. n.* 5394; *Wight! cat. n.* 684.——Neelgherries.

556. (6) C. *mysorensis* (Roth:) suffrutescent, erect, branched, all over hairy: stipules foliaceous, linear-lanceolate, often almost half the length of the leaves: leaves from narrow-linear to narrow-oblong, obtuse: racemes terminal, and sometimes lateral, elongated, drooping before flowering, afterwards erect: flowers distant: bracteas and bracteoles linear-lanceolate, about as long as the calyx, the bracteoles less hairy, glaucous: calyx very hairy, about equal to the corolla, deeply 5-cleft: segments falcate: legume twice as long as the calyx, glabrous, almost quite sessile, broader upwards: seeds numerous.—*Roth. nov. sp. p.* 333; *DC. prod.* 2. *p.* 126; *Spr. syst.* 3. *p.* 237; *Wall.! L. n.* 5361; *Wight! cat. n.* 674, 675, 676, 677.—C. stipulacea, *Roxb. fl. Ind.* 3. *p.* 264.—C. hirsuta, *Roxb. in E. I. C. mus. tab.* 1595.——Mysore. Courtallum.

557. (7) C. *salicifolia* (Heyne!:) herbaceous, erect, branched, thickly clothed with rusty-coloured hairs: stipules wanting, lower leaves oblong-lanceolate, tapering to a point; upper ones narrow-linear, acuminated: racemes terminal, very long, with a few distant flowers: calyx as long as the corolla, deeply 5-cleft, between hairy and tomentose, with an ovate acute bracteole on each side at the base; segments falcate: vexillum and bracteoles glabrous, with a line of hairs along the middle: legumes large, glabrous.—*Wall.! L. n.* 5359. *a.*

558. (8) C. *hirta* (Willd.:) suffrutescent, diffuse, branched, hairy: stipules sometimes at the forks of the branches, subulate, elsewhere wanting: leaves linear-oblong, obtuse, mucronate, sometimes cuneate at the base: racemes terminal, few-flowered: bracteas twice as long as the pedicels, lanceolate: calyx nearly the length of the corolla, very hairy, 5-cleft to below the middle: legume oval, sessile, glabrous, shining, about twice the length of the calyx, 15–20-seeded.—*Willd. enum. p.* 747; *DC. prod.* 2. *p.* 130; *Wight! cat. n.* 678.—C. Chinensis, *Roxb.* (not *Linn.*) *fl. Ind.* 3. *p.* 268; *Wall.! L. n.* 5385.—C. pilosa, *Roxb. in. E. I. C. mus. t.* 370; *Rottl.! nov. act. nat. cur.* 1808.—*Pluk. t.* 185. *f.* 4.

†559. (9) C. *montana* (Roxb.:) shrubby, erect: branches slender, erect, a little hairy when young: stipules and bracteas very minute, subulate: leaves linear-oblong, obtuse, mucronate, somewhat cuneate at the base, covered on both sides with a few silvery hairs: racemes long, many-flowered: calyx hairy, cleft to below the middle; legume sessile, linear-oblong, obtuse, 6–10-seeded.—*Roxb.* (not *Heyne* and *Roth*) *fl. Ind.* 3. *p.* 265; *in E. I. C. mus. tab.* 372.——Circar Mountains; *Roxburgh.*

This appears to be merely a more glabrous form of *C. hirta*, probably from growing in a more northern and mountainous part of the country.

§ 3. Stems erect: stipules minute or wanting, not decurrent: leaves simple, hairy or silky on both sides: racemes lax or capitate. forming a large panicle: bracteas and calyx-segments flat or concave, not viscous: calyx about equal to or shorter than the corolla, clothed with silky hairs, deeply cleft: vexillum silky. —*Fulvæ.*

560. (10) C. *speciosa* (Heyne:) erect, branched, every part shaggy with close-pressed shining rusty-coloured hairs: stipules wanting, or minute and subulate: leaves narrow, oblong, obtuse, mucronate: flowers densely capitate; heads terminal, panicled: bracteas broadly lanceolate, the length of the flowers, with the calyx and vexillum and keel covered with rusty-coloured hairs: calyx deeply 5-cleft: ovary glabrous.—*Heyne! in Roth, nov. sp. p.* 336; *DC. prod.* 2. *p.* 129; *Spr. syst.* 3. *p.* 236; *Wight! cat. n.* 679.—C. cephalotes, *Herb. Madr.!*; *Wall.! L. n.* 5373.——Mysore.

Digitized by Google

561. (11) C. *fulva* (Roxb.:) shrubby, erect, branched, densely clothed particularly on the young plants with soft white or fulvous hairs: stipules none: leaves oblong-lanceolate, mucronate, silky on both sides when young: racemes terminal and from the upper axils: bracteas elliptic-ovate, slightly pointed, at length recurved, about the length of the pedicel: bracteoles similar to the bracteas, about half the length of the calyx: calyx deeply 5-cleft, densely silky; segments flat, oblong, blunt: vexillum silky; keel glabrous: legume sessile, oval, villous, enclosed in the enlarged calyx, 2-seeded.—*Roxb. fl. Ind.* 3. *p.* 266; *in E. I. C. mus. tab.* 1596; *Wall.! L. n.* 5375; *Wight! cat. n.* 936.——Mysore. Neelgherries. Colemala.

562. (12) C. *longipes* (W. & A.:) shrubby, erect, branched; branches, racemes, and midrib beneath shortly white-villous: stipules none: leaves oblong-oval, obtuse or with a short point; both sides clothed with silky pubescence, upper shining and almost silvery: racemes terminal and from the upper axils: bracteas ovate acuminated, concave, deciduous: bracteoles similar to the bracteas, a little below the calyx, deciduous: calyx deeply bilabiate; upper lip bipartite, lower 3-fid, shortly silky; segments lanceolate, acuminated: vexillum silky; keel glabrous, but villous along the lower margins where the petals are free from each other, and along the claws: legume on a stalk almost as long as the calyx-segments, cylindric-oblong, glabrous, 8–10-seeded. *Wight! cat. n.* 990.——Colemala.

§ 4. Stems erect: stipules not decurrent: leaves simple: racemes axillary or terminal, panicled: bracteas permanent; their upper surface and the recurved margins of the segments of the calyx viscous and shining: calyx shorter than the corolla, more or less densely pubescent; vexillum silky: legumes oblong.—*Bracteatæ.*

563. (13) C. *paniculata* (Willd.:) shrubby, much branched, all over villous: stipules (bracteas of abortive racemes?) fascicled, axillary, and bracteas subulate falcate viscid and shining on the upper surface: leaves simple, narrow oblong, obtuse, mucronate: racemes panicled: calyx deeply 5-cleft, segments linear-lanceolate, margins recurved and viscous: vexillum silky on the outside: legumes oblong, sessile, pubescent, about the length of the calyx, 1- or sometimes 2-seeded.—*Willd. sp.* 3. *p.* 982; *DC. prod.* 2. *p.* 126; *Spr. syst.* 3. *p.* 236; *Roxb. fl. Ind.* 3. *p.* 274; *Wall.! L. n.* 5379; *Wight! cat. n.* 664.—C. chinensis, *Lam. encycl. meth.* 2. *p.* 195 (not *Linn.*)——Hills near Vellore. Pathacottah.

564. (14) C. *ramosissima* (Roxb.:) suffrutescent, much branched, spreading, all over villous: stipules linear or wanting: leaves simple, approximate, cuneate-linear, obtuse: racemes terminal, slightly elongated, few-flowered towards the apex, forming a kind of leafy terminal panicle: bracteas alternate, ovate, pointed, recurved, shining and viscous on the upper surface, smaller than or about equal to the similar bracteoles; the lower ones without flowers: calyx deeply 5-cleft; segments with revolute viscous margins, unequal, the upper two much larger than the lower three: vexillum silky: legumes oval, hairy, sessile, about the length of the calyx, 1-seeded.—*Roxb. hort. Bengh. p.* 54; *fl. Ind.* 3. *p.* 268; *in E. I. C. mus. tab.* 1598.—C. tomentosa, *Rottl.!*; *Spr. syst.* 3. *p.* 236; *Wall.! L. n.* 5380.—C. pellita, *Bert.*; *DC. prod.* 2. *p.* 128; *Spr. syst.* 3. *p.* 236.

565. (15) C. *lunulata* (Heyne:) suffrutescent, erect, much branched, clothed all over with glutinous soft hairs patent on the branches and adpressed on the leaves: stipules and bracteas permanent, deeply cordate-ovate, amplexicaul, reflexed, shining and viscid on the upper side: leaves from oblong-oval obtuse to oval-lanceolate: racemes with the lower flowers abortive, forming a large panicle: bracteas alternate, more pointed than the stipules: bracteoles similar to the bracteas, on the middle of the pedicel: calyx deeply

Digitized by Google

5-cleft, shorter than the corolla; margins of the segments scarcely recurved: vexillum silky: legume roundish-oblong, about the length of the calyx, sessile, silky, 1-seeded.—*Heyne in Wall.! L. n.* 5378; *Wight! cat. n.* 663.——Tanjore.

Dr Wight's specimens have almost all the leaves obtuse; the only one of Heyne's that we have seen has them approaching to lanceolate, and acute; but we do not think it necessary to separate them as distinct varieties.

566. (16) C. *subperfoliata* (Wight:) suffruticose, erect, branched, covered all over with slightly shining silky hairs: stipules wanting: leaves elliptic-obovate, mucronate: racemes few-flowered (the lower flowers abortive), axillary and terminal, forming a kind of large leafy panicle: bracteas opposite, cordate-ovate, obtuse, shining and viscid on the upper surface: pedicels opposite!, with the two bracteoles at the base of the calyx: calyx deeply 5-cleft; the margins of the segments recurved: vexillum silky: ovary silky: style bearded towards the apex: legume clavate-oblong, long-stalked, pubescent, much longer than the calyx.—*Wight! in Wall.! L. n.* 5377; *cat. n.* 662.—— Dindygul hills, at the height of 2000 feet.

567. (17) C. *candicans* (W. & A.:) suffruticose, erect, branched, covered all over (except the flowers) with white soft hairs, shaggy on the branches, close pressed and silky on the leaves: stipules inconspicuous or wanting: leaves simple, broad, oval, strongly nerved beneath: racemes terminal on shortish panicled axillary few-leaved branches: bracteas alternate, reniform, reflexed, viscous on the upper side: bracteoles close to the calyx, similar to the bracteas: calyx, vexillum, and ovary, covered with fulvous hairs: margins of the calyx-segments revolute, viscous.—*Wight! cat. n.* 661.——Neelgherries.

568. (18) C. *madurensis* (Wight:) suffruticose, erect, branched, covered all over with fulvous soft hairs: stipules inconspicuous or wanting: leaves simple, ovate obtuse, strongly nerved beneath: racemes numerous, terminal on shortish panicled axillary few-leaved branches: bracteas alternate, ovate, pointed, reflexed at the apex, viscous on their upper surface: bracteoles close to the calyx, similar to the bracteas: calyx, vexillum, and ovary silky with fulvous hairs; calyx-segments deep, their margins revolute, viscous: legumes oblong, almost sessile, covered with a rusty pubescence, many-seeded.—*Wight! in Wall.! L. n.* 5376; *cat. n.* 680.——Madura hills. Neelgherries.

569 (19) C. *pulcherrima* (Roxb.:) shrubby, erect, branched, covered all over with fulvous shining soft hairs: stipules none: leaves cuneate-obovate, obtuse: racemes elongated, terminal, on panicled axillary 1–2-leaved branches; lower flowers abortive: bracteas alternate, cordate, acuminated, reflexed, upper surface viscous: bracteoles on the middle of the pedicels, similar to the bracteas: calyx deeply 5-cleft, shorter than the corolla, and the vexillum silky with fulvous hairs; segments oblong-lanceolate, the margins scarcely recurved: legumes sessile, oblong, glabrous, hid in the permanent calyx, few-seeded.—*Roxb. fl. Ind.* 3. *p.* 267; *in E. I. C. mus. tab.* 1597; *Sim's bot. mag. t.* 2027; *DC. prod.* 2. *p.* 125; *Spr. syst.* 3. *p.* 236; *Wall.! L. n.* 5374; *Wight! cat. n.* 681.—C. pulchra, *Andr. bot. rep. t.* 601; *DC.? prod.* 2. *p.* 126; *Spr. syst.* 3. *p.* 238.——Mysore.

Dr Roxburgh sent seeds to Britain under the name *C. pulcherrima*: Andrews afterwards figured the plant raised from them in his Botanical Repository under that of *C. pulchra*, adding, "we have abridged it to *pulchra*, as we can hardly presume to say which species is *most* beautiful before we have the whole genus." It was then published in the Hortus Kewensis as *C. pulchra* of Andrews, without Roxburgh's synonym; and from that work authors have introduced it into their systems as a distinct species. With regard to De Candolle's synonym we have some doubts, he attributing to his plant setaceous stipules and ovate bracteoles; but he states his specimen to come from the Calcutta garden, and there does not appear to be any with a similar name cultivated there except the present species.

Digitized by Google

§ 5. Stems erect: stipules minute, not decurrent: leaves simple, more or less hairy on both sides, particularly when young: racemes terminal, elongated, simple, many-flowered: bracteas and bracteoles small, narrow, not viscous on their upper side: calyx scarcely so long as the corolla, clothed with a dense rusty-coloured tomentum, cleft almost to the base; segments linear acuminated, falcate, flat-margined: legume oblong, densely clothed with a rusty-coloured tomentum.—*Eriocarpæ.*

570. (20) C. *juncea* (Linn.:) erect, branched, more or less clothed with shining silky pubescence or hairs: branches terete, striated: stipules and bracteas setaceous, minute: leaves from narrow linear to ovate-lanceolate, obtuse with a mucro or acute: racemes elongated, terminating every branch: flowers distant: bracteoles at the base of the calyx, setaceous: calyx deeply 5-cleft, densely covered with rusty tomentum; segments linear-acuminated, the three lower usually cohering at the apex: legumes sessile, oblong, broader upwards, about twice the length of the calyx, tomentose, many-seeded.—*Linn.! sp. p.* 1004; *Sim's bot. mag. t.* 490; *DC. prod.* 2. *p.* 125; *Spr. syst.* 3. *p.* 238; *Roxb.! Cor.* 2. *t.* 193; *fl. Ind.* 3. *p.* 259; *Wall.! L. n.* 5409; *Wight! cat. n.* 665, 666.—C. Benghalensis, *Lam. enc. meth.* 2. *p.* 196; *DC. l. c.*; *Spr. l. c.*; *Wall.! L. n.* 5395.—C. tenuifolia, *Roxb.! fl. Ind.* 3. *p.* 263; *DC. l. c. p.* 126; *Spr. syst. suppl. p.* 275; *Wall.! L. n.* 5368.—C. fenestrata, *Sim's bot. mag. t.* 1933; *DC. l. c.*; *Spr. syst.* 3. *p.* 238.—C. porrecta, *Wall.! L. n.* 5363.—C. viminea, *Wall! L. n.* 5397. *b.*—C. sericea, *Willd. sp.* 3. *p.* 915.—*Pluk. t.* 169. *f.* 5; and *t.* 385. *f.* 6?.

After a careful examination of specimens of the above in different herbaria, we have been unable to discover any permanent characters between them: by cultivation the plants are much more glabrous than the wild ones, and the leaves broader. *C. sericea* of Willdenow is obviously this species, but that part of his description which refers to cordate stipules belongs to what we consider the true *C. sericea:* the two characters have been so combined by De Candolle and Sprengel as to form a definition applicable to no existing species.

*571. (21) C. *tetragona* (Roxb.:) shrubby, erect, young parts villous: young branches acutely 4-angled: stipules and bracteas minute, setaceous: leaves linear-lanceolate, acuminated, slightly villous particularly when young: racemes elongated, terminating every branch: flowers distant, resupinate! when expanded: pedicels horizontal at their base, then bent upwards: bracteoles setaceous, at the base of the calyx: calyx deeply 5-cleft, densely covered with rusty tomentum; segments linear-acuminated, falcate, the three lower ones often united at the apex: legumes sessile, oblong, broader upwards, thrice the length of the calyx, densely tomentose, many-seeded.—*Roxb.! fl. Ind.* 3. *p.* 263; *in E. I. C. mus. tab.* 1593; *Andr. bot. rep. t.* 593; *DC. prod.* 2. *p.* 128; *Spr. syst.* 3. *p.* 238; *Wall.! L. n.* 5367. *a, b, c; Wight! cat. n.* 667.—Missionaries Garden.

This has a different habit from the last, arising principally from the longer leaves and resupinate flowers: but we sometimes entertain doubts if they are permanently distinct.

572. (22) C. *obtecta* (Graham!:) suffruticose, erect, covered all over with a short dense tomentum: branches terete: stipules and bracteas setaceous, minute: leaves oval, mucronate: racemes terminal, elongated; flowers numerous, approximated: bracteoles on the middle of the pedicels, setaceous: calyx deeply 5-cleft, densely covered with rusty tomentum; segments all distinct, linear-acuminated, falcate: legumes sessile, oblong, rather broader upwards, about four times as long as the calyx, densely tomentose, many-seeded.—*Wall.! L. n.* 5372; *Wight! cat. n.* 685.—C. tetragona, *Wall.! L. n.* 5367, *d.*

Digitized by Google

§ 6. Stems tall, erect, branched: stipules not decurrent: leaves simple, usually glabrous on the upper side: racemes terminal or leaf-opposed, many-flowered: bracteas not viscous: calyx cleft to about the middle, rarely slightly villous usually pubescent or almost glabrous, shorter than the corolla; segments flat-margined: legumes oblong, many-seeded, glabrous or softly pubescent.—*Erectæ.*

\+ *Legumes glabrous.*—Retusæ.

573. (23) C. *formosa* (Graham!:) erect, branched, all over villous except the upper side of the leaves: stems terete: stipules minute, setaceous, reflexed: leaves cuneate, obovate, obtuse, glabrous on the upper side, villous beneath: bracteas lanceolate, acuminated, lower ones without flowers: flowers in a dense raceme at the extremities of the bracteated elongated branches: bracteoles setaceous, on the middle of the pedicels: calyx villous: legume oblong, broader upwards, glabrous, about 4 times the length of the calyx, many-seeded.—*Wall.! L. n.* 5393: *Wight! cat. n.* 682.——Neelgherries.

574. (24) C. *Leschenaultii* (DC.:) erect, branched, glabrous except on the under side of the leaves: stems terete: stipules minute, triangular-acuminated, reflexed: leaves cuneate, narrow-obovate, obtuse; upper side glabrous, minutely dotted; under villous: racemes terminal, elongated: bracteas broad-lanceolate, acuminated, about as long as the pedicel: bracteoles minute below the middle of the pedicel: flowers numerous, distant, much larger than the quite glabrous calyx: ovary glabrous.—*DC. prod.* 2. *p.* 125; *Wight! cat. n.* 937.—C. lupiniflora, *Graham in Wall.! L. n.* 5407.——Neelgherries.

575. (25) C. *sericea* (Retz:) erect, branched, glabrous except on the under side of the leaves: stems obtusely angled: stipules large, semisagittate, pointed, reflexed: leaves lanceolate, cuneate at the base, mucronate, pellucid-dotted; upper side glabrous; under prominently nerved, slightly glaucous with a short adpressed silky pubescence: racemes terminal, elongated, many-flowered: bracteas cordate, acuminated, sessile, reflexed, the lower ones without flowers: bracteoles subulate, below the middle of the pedicel: calyx smaller than the corolla, glabrous: legume oblong, glabrous, shortly stalked, many-seeded.—*Retz? obs.* 3. *p.* 26; *Roxb. fl. Ind.* 3. *p.* 273; *Wall.! L. n.* 5406.—C. spectabilis, *Roth, nov. sp. p.* 341; *DC. prod.* 2. *p.* 125; *Spr. syst.* 3. *p.* 237.—C. juncea, *Willd.? sp.* 3. *p.* 974 (not *Linn.*); *Lam.? enc. meth.* 2. *p.* 196.—*Rheed. Mal.* 9. *t.* 26?

We have not at present access to Retz's work, but Roxburgh entertains no doubt about his synonym: we have already alluded to the *C. sericea* of Willdenow, as well as of De Candolle and Sprengel. The descriptions of *C. juncea* given by Willdenow and Lamarck accord so well with Rheede's figure, that we suspect they were prepared from it more than from specimens: and Rheede's representation, on the other hand, expresses accurately the general habit of our plant, with the exception of the omission of the bracteas and stipules. We have never seen the leaves tomentose beneath, as described by Roth. Specimens before us, precisely similar to the Indian ones, were gathered by the late Bertero in a garden ("ex horto Eastensi") in Jamaica, and named *C. retusa* by the late Professor Balbis, from whom we received them.

576. (26) C. *peduncularis* (Graham:) erect, tall, slightly branched, glabrous all over: stems striated: stipules wanting: leaves narrow-linear, acuminated: racemes terminal, elongated, lax, many-flowered: bracteas cordate-acuminated: flowers on long pedicels: calyx glabrous: legume cylindric-oblong, attenuated at the base, glabrous, many-seeded.—*Graham! in Wall.! L. n.* 5369.

We know of only one specimen of this plant and that very imperfect; it is however a very remarkable and distinct species, not liable to be confounded with any other that we know.

Digitized by Google

577. (27) C. *retusa* (Linn.!:) erect, branched, nearly glabrous except on the under side of the leaves: branches striated: stipules and bracteas subulate, minute or often wanting: leaves cuneate-oblong, retuse or rounded, minutely pellucid-dotted; upper side glabrous, under glaucous with a short adpressed silky pubescence: racemes terminal, elongated, many-flowered: bracteoles minute, subulate, above the middle: calyx smaller than the corolla, glabrous; legume oblong, broader upwards, sessile, glabrous, many-seeded.—*DC. prod.* 2. *p.* 125; *Spr. syst.* 3. *p.* 237; *Roxb.! fl. Ind.* 3. *p.* 272; *in E. I. C. mus. tab.* 1594; *Wall.! L. n.* 5405; *Wight! cat. n.* 669.—Lupinus cochinchensis, *Lour. coch.* 2. *p.* 521; *DC. prod.* 2. *p.* 410; *Spr. syst.* 3. *p.* 228. —*Rheed. Mal.* 9. *t.* 25; *Rumph. Amb.* 5. *t.* 96. *f.* 1. (bad).

\+ + *Legumes softly pubescent: leaves distinctly petioled: stipules lunate, transverse, recurved.*—Verrucosæ.

578. (28) C. *verrucosa* (Linn.!:) herbaceous, erect, much branched, young parts minutely pubescent: leaves and racemes acutely 3–4-angled: stipules lunate, transverse, recurved: leaves ovate, suddenly and shortly acuminated at the base, at length nearly quite glabrous on both sides: racemes terminal and leaf-opposed, many-flowered: bracteas small, subulate, reflexed: pedicels rather shorter than the calyx: bracteoles very minute, setaceous, about the middle of the pedicel: calyx smaller than the corolla, slightly pubescent: legume cylindric-oblong, sessile, softly pubescent, many-seeded.—*DC. prod.* 2. *p.* 125; *Spr. syst.* 3. *p.* 237: *Roxb.! fl. Ind.* 3. *p.* 273; *Wall.! L. n.* 5392: *Wight! cat. n.* 688.—C. angulosa, *Lam. enc. meth.* 2. *p.* 197; *Cav. ic.* 4. *t.* 321; *Roxb. fl. Ind.* 3. *p.* 274.—C. cœrulea, *Jacq. ic. rar. t.* 144; *coll.* 1. *p.* 67.—*Rheed. Mal.* 9. *t.* 29; *Burm. Zeyl. t.* 34.

We have not seen specimens agreeing with the var. β of Persoon and De Candolle, characterised by having acuminated leaves, and do not know whether or not it be a distinct species: probably *C. angulosa* of Roxburgh may belong to it, but although enumerated in the hort. Benghalensis, it is not noticed in Wallich's List; we scarcely understand whether it is the base, or the leaves themselves, that is said to be much attenuated in the fl. Indica.

579. (29) C. *Wallichiana* (W. & A.:) herbaceous, erect, much branched, young branches irregularly and rather bluntly angled, with the racemes and under side of the leaves densely pubescent: stipules lunate, transverse, recurved: leaves oval, glabrous above, marked beneath with rather prominent nerves: racemes terminal and leaf-opposed, many-flowered: bracteas subulate, reflexed, small: pedicels elongated, longer than the calyx: bracteoles very minute, setaceous, about the middle of the pedicel: calyx smaller than the corolla, densely pubescent; legume clavate-oblong, stalked, softly pubescent, many-seeded.—*Wight! cat. n.* 696.——Neelgherries.

580. (30) C. *semperflorens* (Vent.:) somewhat shrubby, erect, branched, branches terete or irregularly and rather bluntly angled, with the racemes and under side of the leaves densely pubescent: stipules lunate, transverse, recurved: leaves oval; upper side when young pubescent, afterwards glabrous; under with the nerves prominent and villous: racemes terminal and leaf-opposed, many-flowered: bracteas subulate, small, reflexed: pedicels elongated, longer than the calyx; bracteoles minute, setaceous, near the base of the calyx: calyx smaller than the corolla, densely pubescent: legume oblong, broader upwards, sessile, softly pubescent, many-seeded.—*Ventn. hort. Cels. t.* 17; *DC. prod.* 2. *p.* 125: *Spr. syst.* 3. *p.* 236; *Roxb. fl. Ind.* 3. *p.* 274; *Wall.! L. n.* 5391; *Wight! cat. n.* 694, 695.——Neelgherries.

581. (31) C. *Heyneana* (Graham:) suffruticose ?, erect, branched, glabrous, very slightly pubescent on the young parts: branches terete; stipules lunate, transverse, recurved: leaves oval, pointed at both ends; upper side glabrous, under with a short adpressed pubescence: racemes terminal, many-flowered:

Digitized by Google

bracteas minute, subulate, reflexed: pedicels about the length of the calyx: bracteoles about the middle of the pedicel: calyx with a short adpressed pubescence, shorter than the corolla; the upper lip more deeply cleft than the lower: legume about 4–5 times longer than the calyx, pubescent.—*Wall.! L. n.* 5414; *Wight! cat. n.* 701.—C. albida, *herb. Heyne,* (not *Roth. ?*)——Mysore. Travancore.

The ultimate branchlets appear to become reflexed in a very remarkable manner; but from our having seen very few specimens, and all of them imperfect, we do not know whether this be a peculiarity of growth, or arising from accident. The specimen of *C. albida* in Heyne's herbarium is certainly this species; but the description given by Roth of what he received under that name from Heyne is much at variance.

§ 7. Low plants, branched from the base; branches prostrate or diffuse: stipules not decurrent, often minute or wanting: leaves simple: flowers racemose: bracteas not viscous: calyx slightly pubescent; segments flat-margined: legumes oblong, several-seeded, glabrous or hirsute.—*Diffusæ.*

+ *Legumes hirsute.*

582. (32) C. *hirsuta* (Willd.:) perennial, herbaceous, procumbent, flaccid, hairy: stems terete: stipules lanceolate-subulate, reflexed: leaves from broad-oval to oblong, often acute, nearly glabrous above, hairy beneath: racemes leaf-opposed and terminal, few-flowered: bracteas cordate-acuminated, reflexed, small: bracteoles very minute, about the middle of the pedicel: calyx hairy, cleft almost to the base; segments linear-acuminated, shorter than the corolla: vexillum glabrous, purple-spotted: legumes sessile, oblong, broader upwards, thinly hairy, about twice the length of the calyx, 8–10-seeded.—*Willd. sp.* 3. *p.* 978; *DC. prod.* 2. *p.* 126; *Spr. syst.* 3. *p.* 237; *Roxb. fl. Ind.* 3. *p.* 270; *Wall.! L. n.* 5413. *a*; *Wight! cat. n.* 702.—C. clavata, *Roxb. in E. I. C. mus. tab.* 366.——Samulcottah.

583. (33) C. *bifaria* (Linn.:) procumbent, herbaceous, clothed with a somewhat rigid pubescence: branches slender, elongated, terete: stipules small, ovate, acuminated, reflexed: leaves from orbicular to oblong or narrow linear, pubescent or at length nearly glabrous: racemes terminal and leaf-opposed, 1–2-flowered: bracteas cordate-acuminated: bracteoles extremely minute, below the middle of the pedicel: calyx harshly pubescent, deeply 5-cleft, shorter than the corolla; segments linear-lanceolate, acuminated, coloured along the margins, pale in the middle: legumes obovoid, hispidly pubescent or almost hairy, mottled with purple.—*Linn.! suppl. p.* 322; *DC. prod.* 2. *p.* 127; *Spr. syst.* 3. *p.* 236; *Wall.! L. n.* 5399 (partly); *Wight! cat. n.* 687.—C. dichotoma, *Roth, nov. sp. p.* 340; *DC. l. c.; Spr. l. c. p.* 237.——Tanjore.

The specimens from Heyne's herbarium correspond so well with Roth's character of *C. dichotoma,* that we have no hesitation in considering it the same: they are firmer and more rigid in their whole habit than those in Linnæus's harbarium and our own, a circumstance which seems to have led Roth to have supposed them erect, although really procumbent. When the racemes are 1-flowered, the bracteas are in pairs at the base of the pedicel; when 2-flowered, solitary.

584. (34) C. *evolvuloides* (Wight:) perennial, diffuse, all over hispidly pubescent or somewhat hairy: branches terete, slender: stipules lanceolate, reflexed: leaves from oval to lanceolate, nearly glabrous on the upper surface: racemes leaf-opposed, 3–8-flowered: bracteas cordate, acuminated, reflexed: bracteoles very minute, about the middle of the pedicels: calyx hairy, deeply 5-cleft, nearly equal to the corolla: legumes about thrice the length of the calyx, sessile, oblong, hairy, about 3-seeded.—*Wight! in Wall.! L. n.* 5410; *cat. n.* 686.—C. rubiginosa, *Roxb.* (not *Willd.*) *fl. Ind.* 3. *p.* 269.

Digitized by Google

—C. pusilla, *Roxb.* (not *Heyne*) *in E. I. C. mus. tab.* 371.—C. triflora, *Heyne! in Wall.! L. n.* 5387.—C. hirsuta, *Wall! L. n.* 5413. *b.*—C. bifaria, *Wall.! L. n.* 5399 (partly).——Dindygul hills.

585. (35) C. *pusilla* (Heyne:) annual, small, branched from the base, clothed all over with short hairs: root slender: branches slender, terete, lower ones diffuse: stipules wanting: leaves simple, linear, obtuse, mucronate: racemes terminating the branches, somewhat unilateral: bracteas minute, setaceous, caducous: calyx deeply 5-cleft, about as long as the corolla; segments subulate: legume (small), sessile, 2–3 times the length of the calyx, oval, hirsute, 3–4-seeded.—*Heyne* (not *Roxb.*) *in Roth, nov. sp. p.* 335; *DC. prod.* 2. *p.* 128; *Spr. syst.* 3. *p.* 239; *Wall.! L. n.* 5396: *Wight! cat. n.* 699.——Dindygul hills.

+ + Legumes glabrous; stipules inconspicuous.

586. (36) C. *prostrata* (Roxb.:) suffruticose, small, branched from the base: branches hairy, slender, terete, prostrate: stipules wanting: leaves simple, elliptic-oblong, slightly oblique at the base, sprinkled with long silky hairs most abundant and close pressed on the under side: racemes leaf-opposed or terminal on almost leafless branches, few-flowered: bracteas minute, subulate: flowers small: calyx hairy, rather shorter than the corolla; upper lip bifid; lower deeply 3-cleft: legume sessile, glabrous, oblong, broader upwards, 4–6 times longer than the calyx, several-seeded.—*Roxb.! hort. Bengh. p.* 54; *fl. Ind.* 3. *p.* 270; *in E. I. C. mus. tab.* 368; *Rottl. in Willd. enum. p.* 747; *DC. prod.* 2. *p.* 130; *Spr. syst.* 3. *p.* 238; *Wall.! L. n.* 5419.—C. obliqua, *Ham.! in Wall.! L. n.* 5388. *a.*——Near Samulcottah, rare; *Roxburgh.*

When a specimen of the first year's growth is gathered, the root is slender, and appears as if annual; such forms the state called *C. obliqua* by Hamilton. Wall. L. n. 5388. *b, c,* and *C. ferruginea,* Gr. ! in Wall. L. n. 5398, as well as *C. canescens,* Wall. ! L. n. 5415, appear to be the same with *C. crassifolia,* Ham.! in Wall. L. n. 5416.

587. (37) C. *albida* (Heyne ?:) suffruticose, branched from the base, covered all over with short adpressed silvery hairs: branches procumbent, diffuse, slender, terete, simple below, branched above: stipules wanting: leaves cuneate-oblong, obtuse or often emarginate, mucronate, pellucid-dotted; upper side nearly glabrous: racemes terminal, elongated, many-flowered: bracteas subulate, minute, patent: bracteoles attached to the tube of the calyx, subulate: flowers drooping: calyx 5-cleft to below the middle, covered with short adpressed hairs; the two upper segments lanceolate, longer than the corolla; the three lower linear-lanceolate: legume oblong, broader upwards, sessile, glabrous, about twice the length of the calyx, 3–4-seeded.—*Heyne? in Roth? nov. sp. p.* 333; *DC.? prod.* 2. *p.* 126; *Spr.? syst.* 3. *p.* 237; *Wight! cat. n.* 671, 673.—C. punctata, *Graham! in Wall.! L. n.* 5401.—C. parva, *Graham! in Wall.! L. n.* 5402. *a, b, c?*—C. linifolia, *Willd.?* (not *Linn.*) *sp.* 3. *p.* 975; *Roxb.? fl. Ind.* 3. *p.* 266.——Neelgherries.

Our only doubt about Roth's synonym arises from his describing his plant erect, which he might have presumed from imperfect specimens. The *C. linifolia* of Willdenow and Roxburgh appears to be the same, although they, in accordance with Linnæus, ascribe to it a short legume. *C. scoparia,* Wall. ! L. n. 5418, differs very slightly by the leaves being oblong-linear; but we can point out scarcely any other character.

588. (38) C. *viminea* (Graham:) suffruticose, diffuse, branched from the base; branches terete, nearly simple or slightly branched towards the extremity, strigose as well as the racemes and under side of the leaves with adpressed pubescence: stipules wanting: leaves pellucid-dotted, lower ones from obcordate to cuneate-oblong and emarginate; upper surface glabrous:

Digitized by Google

racemes terminal, elongated: flowers numerous, distant: bracteas minute, subulate, reflexed: bracteoles minute, attached to the tube of the calyx between the lips: pedicels short: calyx about equal to the corolla, nearly glabrous, coloured; upper lip broad, shortly bifid; lower deeply 3-cleft, the segments often cohering at the apex: legume oblique, oblong, sessile, a little longer than the calyx, glabrous, 8–12-seeded.—*Graham! in Wall.! L. n.* 5397; *Wight! cat. n.* 668.——Madura.

We have some doubts if this be really distinct from the following.

589. (39) C. *linifolia* (Linn.:) cespitose, suffruticose, diffuse, branched from the base, more or less strigose; branches terete, nearly simple below, branched upwards: stipules wanting: leaves from cuneate to linear-oblong, obtuse, slightly mucronate, nearly glabrous above, strigose with adpressed short hairs beneath: racemes terminal, elongated, many-flowered: bracteas subulate, small: pedicels short: bracteoles attached to the tube of the calyx between the lips: calyx densely covered with short adpressed hairs; upper lip broad, very shortly bifid: lower deeply 3-cleft: legume oblique, roundish ovoid, sessile, glabrous, scarcely so long as the calyx, 8–12-seeded.—*Linn.! f. suppl. p.* 322; *DC. prod.* 2. *p.* 128; *Spr. syst.* 3. *p.* 239; *Wall.! L. n.* 5400; *Wight! cat. n.* 670, 703.—C. cæspitosa, *Roxb. fl. Ind.* 3. *p.* 269.—C. diffusa, *Roxb. in E. I. C. mus. tab.* 367.—C. tecta, *Heyne in Roth, nov. sp. p.* 334; *DC. prod.* 2. *p.* 126; *Spr. syst.* 3. *p.* 237.—C. montana, *Heyne* (not *Roxb.*) *in Roth, nov. sp. p.* 335; *DC. l. c.; Spr. l. c.*—C. sobolifera, *Graham! in Wall.! L. n.* 5420.

This appears to vary considerably as to pubescence; Roxburgh's *C. cæspitosa* or *diffusa* being described and figured almost glabrous, while Dr Wight's *n.* 703 is whitish, from the numerous short silvery hairs covering every part except the upper side of the leaves. This species and the last are readily distinguished from the others by the shortly bifid upper calycine lip; but from each other the only differences are to be sought for in the shape of the leaves and legume, and pubescence of the calyx.

§ 8. Low hairy plants, branched from the base; branches prostrate: stipules wanting: leaves simple, bifarious: peduncles elongated, about 2-flowered: legumes globose, hairy, several-seeded.—*Sphærocarpæ.*

590. (40) C. *biflora* (Linn.:) prostrate, diffuse, hairy: stipules wanting: leaves simple, bifarious, broadly ovate, slightly oblique and cordate at the base, obtuse, mucronate: peduncles leaf-opposed, 3–4 times longer than the leaves, about 2-flowered: bracteas and bracteoles setaceous: calyx deeply 5-cleft, hairy; segments linear-acuminated, about equal to the corolla: legume sessile, globose, hairy, somewhat membranous; seeds numerous (12–20), crowded.—*Linn.! mant. p.* 570 *(excl. syn. Burm. and descript.); DC.? prod.* 2. *p.* 127; *Roxb. in E. I. C. mus. tab.* 362; *Wight! cat. n.* 698.—C. Nummularia, *Willd. sp.* 3. *p.* 979; *DC. l. c.; Spr. syst.* 3. *p.* 237; *Roxb. fl. Ind.* 3. *p.* 271; *Wall.! L. n.* 5417 (excl. *e*).—C. hirta, *Roth! nov. sp. p.* 339.—C. Rothiana, *DC. l. c.*—C. Rothii, *Spr. l. c.*—Astragalus biflorus, *Linn.! mant. p.* 273.—Cicer nummulariæfolium, *Lam. enc. meth.* 2. *p.* 2; *DC. l. c. p.* 354.—*Pluk. t.* 389. *f.* 5.

591. (41) C. *globosa* (Wight:) prostrate, diffuse, hairy: stipules wanting: leaves simple, orbicular: peduncles leaf-opposed, 3–4 times longer than the leaves, about 2-flowered: bracteas and bracteoles setaceous: calyx deeply 4-cleft, hairy; segments lanceolate-acuminated, shorter than the corolla: legume sessile, globose, sparingly hairy, hard-coriaceous, few- (about 4-) seeded.—*Wight! in Wall.! L. n.* 5412 (written by mistake *globulosa*); *cat. n.* 697.——Dindygul hills.

Less hairy than the last species.

Digitized by Google

§ 9. Low hairy plants; branched from the base: branches diffuse or ascending: stipules wanting: leaves simple, scattered: peduncles few-flowered, leaf-opposed, aggregated at the extremities of leafy branchlets: legumes sessile, small, globose or ovoid, black, glabrous.—*Microcarpæ.*

592. (42) C. *nana* (Burm.:) cæspitose, hairy, branched from the base: branches terete, slender, lower ones diffuse: stipules wanting: leaves simple, oblong, broader upwards, obtuse: flowers 2–3 on short leaf-opposed peduncles, or 5–6 in nearly sessile terminal umbels: calyx very hairy, as long as the corolla: legume ovoid, sessile, glabrous (black), about a half longer than the calyx.—*Burm. fl. Ind. p.* 156. *t.* 48. *f.* 2; *DC. prod.* 2. *p.* 127; *Wight! cat. n.* 672.—C. biflora, *Willd.? sp.* 3. *p.* 978; *Spr. syst.* 3. *p.* 237; *Wall.! L. n.* 5381.—C. melanocarpa, *Wall.! L. n.* 5382 (partly).—C. umbellata, *Wall.! L. n.* 5383 (partly).—C. nummularia, *Wall.! L. n.* 5417. *e.*—*Pluk. t.* 386. *f.* 7.?——Southern provinces, common.

593. (43) C. *umbellata* (Wight:) branched from the base, very hairy: branches terete, ascending, elongated, twiggy: stipules wanting: leaves oblong, slightly acute; flowers numerous, forming terminal umbels: calyx very hairy, as long as the corolla; upper lip shortly bifid: legume globose, sessile, glabrous (black), scarcely longer than the calyx, 6–8-seeded.—*Wight! cat. n.* 700; *Wall.! L. n.* 5383 (partly).——Dindygul hills.

b. Leaves long-petioled, digitately 3–5*-foliolate.*

§ 10. Leaves trifoliolate: legumes pubescent, ovate, gibbous, obliquely beaked by the hardened base of the style: seeds 2, opposite.—*Disperma—Cyrtolobus*, R. Brown in Wall. L. n. 5432.

594. (44) C. *rigida* (Heyne:) shrubby, very rigid, much and divaricately branched: ultimate branchlets woody, pubescent: stipules minute, setaceous: leaves trifoliolate, on a very short petiole: leaflets small (scarcely 2 lines long), broadly obcordate; upper side nearly glabrous, under pubescent: racemes few-flowered, terminating the branchlets.—*Heyne in Roth nov. sp. p.* 343; *DC. prod.* 2. *p.* 133; *Spr. syst.* 3. *p.* 239; *Wight! cat. n.* 714.—— Vellanganny near Negapatam, on sandy soil.

595. (45) C. *Willdenowiana* (DC.:) shrubby, much branched: young parts shortly villous: stipules lanceolate-subulate, conspicuous on the young branches: leaves trifoliolate; leaflets cuneate-linear, retuse or emarginate, about twice the length of the common petiole (about half an inch long and a line broad), pubescent on both sides, but particularly on the under: racemes terminal, 6–8-flowered on the extremity of the branches, 2–4-flowered on the axillary short nearly leafless branchlets.—*DC. prod.* 2. *p.* 134; *Wight! cat. n.* 716, 717.—C. spartioides, *Spr. syst.* 3. *p.* 240; *Wall.! L. n.* 5435.—C. genistoides, *Willd. sp.* 3. *p.* 987.

596. (46) C. *rostrata* (W. & A.:) shrubby, much branched; branches woody, and with the petioles and racemes softly pubescent: stipules long-subulate: leaves trifoliolate: leaflets obovate-oblong, obtuse or slightly acute, mucronate, nearly equal to the petiole (from one-half to three-fourths of an inch long and one-fourth of an inch broad); upper side glabrous and minutely dotted; under pale with a silky adpressed pubescence: racemes terminal and leaf-opposed, many-flowered: flowers approximated: bracteas lanceolate-subulate, permanent, about half the length of the pedicels.—*Wight! cat. n.* 720.

597. (47) C. *trifoliastrum* (Willd.:) suffruticose; stems several, woody, erect or ascending: branches long and nearly simple, straight and twiggy, tomentose: stipules minute, setaceous: leaves rather distant, trifoliolate, long-petioled; leaflets cuneate, obcordate, shorter than the petiole, (from

Digitized by Google

half an inch to an inch long); upper side glabrous; under paler, sprinkled with minute adpressed hairs: racemes terminal, elongated (3–5 inches long), many-flowered, with occasionally a few-flowered peduncle in the axils of the upper leaves; flowers distant (pretty large): bracteas subulate,.—*Willd. sp.* 3. *p.* 983; *Roxb. fl. Ind.* 3. *p.* 277; *Wall.! L. n.* 5432 (exclud. *g*, *h*); *Wight! cat. n.* 719, 721.—C. virgata, *Roxb. in E. I. C. mus. tab.* 373.—C. medicaginea, *DC. l. c. p.* 133 (not *Lam.*).—C. stricta, *Roth, nov. sp. p.* 342; *DC. l. c.*—Lupinus trifoliatus, *Rottl.! in nov. act. nat. cur. Berol.* 4. 1803, *p.* 223. *t.* 5.

598. (48) C. *Notonii* (W. & A.:) suffruticose, erect: branches divaricating, shortish, tomentose: stipules narrow-subulate: leaves slightly approximated, trifoliolate, long-petioled; leaflets cuneate-obovate, scarcely retuse, mucronate, rather longer than the petiole (from a half to an inch long, and one-third of an inch broad); upper side glabrous; under paler, sprinkled with minute adpressed hairs: racemes terminal or leaf-opposed, shortish (2–3 inches long), many-flowered: flowers approximated (pretty large): bracteas linear.—*Wight! cat. n.* 991.—C. Trifoliastrum, *Wall.! L. n.* 5432. *g.* ——Neelgherries. Awvety.

The whole habit and the texture of the leaves differ considerably from *C. trifoliastrum.*

599. (49) C. *neglecta* (W. &. A.:) suffruticose, procumbent, diffuse, branched: branches elongated, twiggy, harshly-pubescent: stipules setaceous, minute: leaves trifoliolate; leaflets cuneate-oblong, retuse or emarginate, usually mucronate, longer than the petiole (about 6 lines long and 2 broad); upper side glabrous; under with adpressed pubescence: racemes leaf-opposed, stiff, few-flowered, 3–5 times longer than the leaves: bracteas subulate, nearly as long as the short pedicels, scattered along the rachis, some of the lower ones occasionally without flowers: flowers small.—*Wight! cat. n.* 718.—C. procumbens, *Wall.! L. n.* 5437. *a*, *b*, *e*, *i* (not *Roxb.*).—C. trifoliastrum, *Wall.! L. n.* 5432. *h.*—C. virgata, *Mart.?* (not *Roxb.*); *DC.? prod.* 2. *p.* 131.——Gingie-hills, and probably elsewhere not uncommon.

Perhaps *C. virgata* of Martius and De Candolle may belong to this species, but their description is exceedingly imperfect: we hesitate about bringing it here principally from its leaves being described glabrous, and from the flowers of *C. Orixensis* being said by Martius to be the most minute of the genus, while those of *C. neglecta* are much smaller. *C. medicaginea*, Ham.! in Wall.! L. n. 5434 (not *Lam.*), appears to be a luxuriant form of *C. neglecta*, but we have only seen a specimen in flower.

600. (50) C. *medicaginea* (Lam.:) suffruticose, prostrate, diffuse, branched: branches pubescent: stipules setaceous, minute, deciduous: leaves trifoliolate: leaflets cuneate-oblong, emarginate, nearly twice the length of the petiole (3–4 lines long and 1–2 broad); upper side glabrous; under sparingly pubescent: peduncles leaf-opposed, filiform, 2–3 times the length of the leaves, bearing 2 small flowers towards the apex; bracteas minute, not half the length of the pedicels, all with flowers in their axils.—*Lam. enc. meth.* 2. *p.* 201; *Spr. syst.* 3. *p.* 239; *Wight! cat. n.* 715.—C. procumbens, *Roxb. fl. Ind.* 3. *p.* 278; *in E. I. C. mus. tab.* 374; *Wall.! L. n.* 5437. *c*, *d*, *f*, *g* (partly), *h.*—C. divaricata, *Graham! in Wall.! L. n.* 5436.—C. foliosa, *Willd. enum. p.* 747; *DC. prod.* 2. *p.* 131; *Spr. syst.* 3. *p.* 240.—Indigofera foliosa, *Rottl.; herb. Madr.!—Pluk. t.* 98. *f.* 7 (good).

This species and *C. neglecta* are very closely allied; and unless specimens of both be in a perfect state, it is almost impossible to distinguish them.

601. (51) C. *herniarioides* (W. & A.:) perennial, slightly suffruticose, prostrate, diffuse: branches filiform, pubescent: stipules none: leaves trifoliolate, shortly petioled; leaflets orbicular-obcordate, nearly thrice the length of the common petiole (about a line long); upper side glabrous;

Digitized by Google

under covered with adpressed pubescence: peduncles leaf-opposed, several times the length of the leaves, bearing 3–4 flowers along their upper half.—*Wight! cat. n.* 713.—C. procumbens, *Wall.! L. n.* 5437. *g* (partly).——Sandy soil near Arcot.

Besides the above, *C. elliptica*, Roxb.!, a native of China, is enumerated in Wallich's List (*n.* 5433) as a species of *Cyrtolobus*: it has, however, neither the pod nor opposite seeds characteristic of that subgenus as we have defined it, but is more allied to *C. Orixensis*. We may here remark, that previous to the arrival of the third volume of Roxburgh's Flora Indica in Britain, Hooker and Arnott had described the same plant in the Bot. of Beechey's Voyage, p. 180, as *C. Vachellii*, a name which must give way to that given by Roxburgh: perhaps, however, it is not distinct from *C. uncinella*, Lam. ill. t. 617. f. 2, from the Mauritius, but probably introduced there from China; and if so, Lamarck's name is certainly the oldest.

§ 11. Leaves 3-foliolate: legumes oblong, obtuse at both ends, on a longish filiform stalk, several-seeded. — *Podocarpæ.—Clavulium*, Desv. in ann. sc. nat. 9. p. 407.

602. (52) C. *laburnifolia* (Linn.:) shrubby, erect, glabrous: branches terete: stipules wanting; leaves trifoliolate; leaflets broadly oval, usually acute at both ends: racemes elongated, terminal and leaf-opposed, many-flowered: bracteas subulate, minute, deciduous; bracteoles very minute, setaceous, below the middle of the pedicel: flowers large (yellow), long-pedicellate: keel acuminated, rather longer than the vexillum, about twice the length of the alæ: legume stalked, quite glabrous, cylindric-oblong, about three times as long as broad; stalk much longer than the calyx, a little shorter than the legume.—*Linn.! sp. p.* 1005; *DC. prod.* 2. *p.* 130; *Spr. syst.* 3. *p.* 240; *Roxb. fl. Ind.* 3. *p.* 275; *in E. I. C. mus. tab.* 363; *Wall.! L. n.* 5424; *Wight! cat. n.* 710.—C. pendula, *Bert.; DC. l. c.*—C. pedunculosa, *Desv.; DC. l. c. p.* 132.—Clavulium pedunculosum, *Desv. in ann. sc. nat.* 9. *p.* 407.—*Burm. Zeyl. t.* 35; *Rheed. Mal.* 9. *t.* 27.——Southern provinces, common.

By drying, the bright yellow blossoms often become purplish.

603. (53) C. *Orixensis* (Roxb.:) perennial, herbaceous, procumbent: branches terete, racemes, and lower surface of the leaves, slightly hairy: stipules lanceolate, small, hairy: leaves trifoliolate; leaflets obovate, upper side glabrous: racemes elongated, leaf-opposed, slender, many-flowered: bracteas cordate, acuminated, reflexed, permanent; bracteoles subulate, close to the base of the calyx, reflexed: flowers small, on long filiform pedicels: corolla scarcely longer than the calyx: legume stalked, quite glabrous, short cylindrical, scarcely a half longer than broad, more than twice the length of the stalk, few-seeded; stalk scarcely longer than the calyx.—*Roxb. fl. Ind.* 3. *p.* 276; *in E. I. C. mus. tab.* 375; *Rottl. in Willd. enum. p.* 747; *DC. prod.* 2. *p.* 131; *Spr. syst.* 3. *p.* 240; *Wall.! L. n.* 5426; *Wight! cat. n.* 712. —*Pluk. t.* 52. *f.* 2.——Circars. Travancore.

* 604. (54) C. *stipitata* (Graham:) shrubby, diffuse, branched: branches terete, striated, nearly glabrous: stipules minute and setaceous, or wanting: leaves trifoliolate; leaflets obcordate, upper side glabrous, under pubescent: racemes acutely flexuose, few-flowered, only at the ends of the small branchlets: corolla much longer than the calyx; vexillum silky; keel sharply bent near the base, then quite straight and rostrate: legume stalked, oblong, slightly broader upwards, ending in a thick short point, few-seeded; stalk slightly longer than the calyx.—*Graham! in Wall.! L. n.* 5425.

We introduce this plant with doubt, because the specimens of Wall. L. n. 5425. *a*, are said to be derived from Heyne's herbarium with the name of *C. trifoliastrum*. Specimens of that plant are, however, confused with the true *C. stipitata*, under both *a* and *b*: so that perhaps Heyne's plant is the true *C.*

Digitized by Google

trifoliastrum, while the specimens from the Calcutta Botanic Garden alone are *C. stipitata*, and the mixture may have arisen from accident.

§ 12. Leaves 3-foliolate: legumes oblong, sessile or attenuated at the base with a kind of short stalk, several-seeded.—*Hedræocarpæ*.

605. (55) C. *clavata* (W. & A.:) erect, branched, all over whitish with a short adpressed pubescence except the upper side of the leaves: stipules very small, setaceous, patulous: leaves trifoliolate: leaflets cuneate-obovate, retuse, mucronate; upper side glabrous: petioles grooved above: racemes leaf-opposed, elongated, many-flowered: bracteas setaceous, reflexed: flowers shortly pedicellate: bracteoles lanceolate, reflexed, attached to the base of the calyx: calyx half the length of the glabrous corolla; upper lip shorter than the lower: vexillum and falcate keel slightly longer than the alæ: legume pendulous and parallel to the rachis, clavate, tapering at the base into a kind of short stalk, slightly covered with adpressed pubescence, many- (10–12-) seeded.—*Wight! cat. n.* 711.—C. cytisoides, *Wight! in Wall.! L. n.* 5424. *d.*——Cunnawady near Dindygul.

§ 13. Leaves digitately 5–7-foliolate: calyx nearly glabrous: legumes large, clavate-oblong, glabrous, attenuated at the base into a kind of short stalk: seeds numerous.—*Polyphyllæ*.

606. (56) C. *quinquefolia* (Linn.:) annual, erect, branched, pubescent or nearly glabrous: stems hollow: stipules small, setaceous, recurved: leaves 5-foliolate, some of them occasionally trifoliate or very rarely simple; leaflets usually longer than the petioles, from lanceolate to narrow-linear; upper side glabrous, under of the younger ones often covered with a short silky pubescence: petioles grooved above: racemes terminal, much elongated, many-flowered: bracteas lanceolate, reflexed; bracteoles subulate, near the base of the pedicel: flowers large, rather distant: legumes clavate-oblong, glabrous, attenuated at the base into a stalk much shorter than the calyx; seeds very numerous.—*Linn.! sp. p.* 1006; *DC. prod.* 2. *p.* 131; *Spr. syst.* 3. *p.* 241; *Roxb. fl. Ind.* 3. *p.* 279; *in E. I. C. mus. tab.* 374; *Wall.! L. n.* 5429; *Wight! cat. n.* 704, 707.—C. heterophylla, *Linn.! suppl. p.* 323; *DC. l. c. p.* 131; *Spr. l. c.*—*Rheed. Mal.* 9. *t.* 28.

The Linnean specimen of *C. heterophylla* is imperfect; but after a careful examination of it, we are induced to regard it as an accidentally trifoliate state of the present species: the leaflets are slightly broader than usual, and almost obovate. The whole specimen consists of the end of a branch, or perhaps the top of a stunted plant, about 6 inches long; in some of the lower leaves the lateral leaflets have become abortive, as often happens in the common form of the species.

607. (57) C. *digitata* (Hooker:) somewhat shrubby, erect, branched, everywhere (except the flowers) densely tomentose: stipules subulate, reflexed: leaves digitate; leaflets 5 or rarely 7, obovate: racemes terminal and leaf-opposed, elongated, many-flowered: bracteas lanceolate, reflexed: bracteoles setaceous, near the base of the pedicels: flowers large, approximated, long-pedicelled: legumes large, clavate-oblong, glabrous, attenuated at the base into a short stalk scarcely the length of the calyx: seeds numerous.—*Hook.! in Bot. misc.* 2. *p.* 354. *suppl. t.* 16 (engraved *C. quinquefolia*); *Wight! cat. n.* 705.——Madura Hills.

We have retained the name given by Dr Hooker in place of restoring that of *C. tomentosa*, originally given to this species by Dr Wight in the Bot. misc. l. c., although the objection there stated be removed; the *C. tomentosa* of Rottler being the same as Roxburgh's *C. ramosissima*.

608. (58) C. *Grahamiana* (W. & A.:) shrubby, erect, branched, everywhere densely villous with adpressed silky hairs except the flowers and upper side of the leaves: stipules subulate, reflexed: leaves digitate; leaflets

Digitized by Google

5–7, cuneate-oblong, obtuse or retuse, upper side glabrous: racemes terminal: bracteas lanceolate, acuminated, reflexed: flowers large, approximated, on longish pedicels: bracteoles setaceous near the base of the pedicels: legumes large, glabrous, oblong, attenuated at the base into a short stalk: seeds numerous.—*Wight! cat. n.* 706.—C. digitata, *Wight!* (not *Hook.*) *in Wall.! L. n.* 5430.——Dindygul hills, at an elevation of 4000 feet.

B. *Stems herbaceous, rarely shrubby: leaves usually palmately* 3–5*-foliolate, very rarely unequally pinnated; primordial ones alternate: stamens diadelphous: legume* 1*-celled.*—Trifoliæ, *Brown.*

V. ROTHIA. *Pers.*

Calyx 5-cleft to the middle: segments broad; the two upper ones falcate, distinct but close together, and forming as if one vaulted segment pressing upon the vexillum. Corolla inserted into the bottom of the calyx, papilionaceous: vexillum oblong-obovate, straight or slightly recurved towards the apex: alæ about the length of the keel, and slightly shorter than the vexillum, oblong: keel-petals distinct or scarcely cohering, a little obtuse, and not acuminated. Stamens monadelphous, the sheath split on the upper side. Style glabrous, filiform, straight. Stigma capitate. Legume linear, acuminated at both ends, sessile, compressed, many-seeded. Seeds compressed, reniform: cotyledons thin: radicle at the end of the seed, curved up along the edge of its lobes to their middle—Annual, prostrate, thickly sprinkled on the stems, petioles, pedicels, and legumes, with longish soft silky hairs. Leaves petioled, palmately trifoliolate; leaflets all nearly sessile, cuneate-oblong, rather fleshy: upper surface almost glabrous; under with adpressed hairs. Stipules foliaceous, oblong, partial ones wanting. Pedicels solitary or in pairs, opposite to the leaves, with setaceous bracteoles above the middle.

609. (1) R. *trifoliata* (Pers.)—*Pers. syn.* 2. 638; *DC. prod.* 2. *p.* 382; *Wall.! L. n.* 5821; *Wight! cat. n.* 828.—Dillwynia trifoliata, *Roth, cat. bot.* 3. *p.* 71; *Pers. syn.* 2. *p.* 302.—Harpelema, *Jacq. ecl.* 2. *t.* 129.—Westonia humifusa, *Spr. syst.* 3. *p.* 230.—Glycine humifusa, *Willd. enum. p.* 756; *Roth, nov. sp. p.* 349.—G. leptocarpa, *Graham! in Wall.! L. n.* 5515.—Trigonella Indica, *Linn.! sp. p.* 1095; *Spr. syst.* 3. *p.* 282; *Roxb. fl. Ind.* 3. *p.* 389; *in E. I. C. mus. tab.* 412.—Lotus Indicus, *Desr. in Lam. enc. meth.* 3. *p.* 606; *DC. l. c. p.* 210.—Hosackia Indica, *Graham! in Wall.! L. n.* 5940.—*Pluk. t.* 200. *f.* 7, and *t.* 231. *f.* 5.

VI. TRIGONELLA. *Linn.; Gærtn. fr.* 2. *t.* 152. *f.* 3; *Lam. ill. t.* 611.

Calyx campanulate, 5-cleft. Vexillum and alæ nearly equal, spreading in the form of a 3-petalled corolla: keel very small, patent. Stamens diadelphous (9 and 1). Legume continuous, oblong, compressed or cylindrical, acuminated, many-seeded.—Herbaceous plants, with a heavy penetrating odour. Leaves trifoliolate, the terminal leaflet stalked.

*610. (1) T. *Fœnum-græcum* (Linn.:) annual: stem erect, simple: leaflets obovate, obsoletely toothed: stipules lanceolate-falcate, entire: flowers sessile, solitary or in pairs: calyx hairy; the teeth subulate, the length of the tube: legumes elongated, compressed, longitudinally reticulated, falcate, with a long beak about half the length of the legume: seeds large, ovate, and wrinkled; the radicle prominent.—*Linn. sp. p.* 1095; *Ser.! in DC. prod.* 2. *p.* 182; *Spr. syst.* 3. *p.* 284; *Gærtn. fr. t.* 152. *f.* 3; *Wall.! L. n.* 5984; *Wight! cat. n.* 722.

Digitized by Google

*611. (2) T. *corniculata* (Linn.:) annual: stem somewhat erect, sometimes flexuose or diffuse, glabrous: leaflets obovate, toothed or serrated towards the apex: stipules lanceolate, nearly entire or toothed: peduncle axillary, longer than the leaves, mucronate at the apex: racemes many-flowered, at first dense and umbiliform, afterwards lengthening: corolla thrice the length of the calyx: legumes compressed, declinate, falcate, short pointed, transversely veined: seeds reniform, rugose; radicle prominent.—*Linn. sp. p.* 1094; *Ser.! in DC.! prod.* 2. *p.* 184; *Spr. syst.* 3. *p.* 284; *Roxb.! fl. Ind.* 3. *p.* 389.—T. esculenta, *Willd. enum. p.* 709; *DC. l. c. p.* 185; *Spr. l. c.*; *Wall.! L. n.* 5985.—T. elatior, *Sm. and Sibth.*; *DC. l. c. p.* 183; *Spr. l. c. p.* 283.—Medicago esculenta, *Roxb. in E. I. C. mus. tab.* 1167.

This and the last are only known in India in a state of cultivation. The present, when growing in a luxuriant soil, has the stipules always setaceously-toothed; but in a dry soil, they are often nearly quite entire. We do not know any character to separate *T. elatior*, Sm., described at length in Rees' Cyclopedia, the terminal bristle of the raceme being only very small, not wanting; specimens thus named, and correctly so as we think, agreeing precisely with Wallich's Indian specimens, were distributed by the Unio Itineraria, gathered at Smyrna by Fleischer in 1827.

VII. MELILOTUS. *Tourn.*; *Lam. ill. t.* 613.

Calyx tubular, softly 5-toothed. Corolla deciduous: keel simple; alæ shorter than the vexillum: the keel and the alæ cohering, free from the stamen tube: vexillum free. Stamens diadelphous (9 and 1). Style terminal filiform. Legumes globose or ovoid, longer than the calyx, coriaceous, scarcely dehiscent, 1- or few-seeded.—Herbaceous annual or perennial plants. Leaves trifoliolate; leaflets often toothed, the terminal one stalked. Stipules connate with the petiole. Peduncles axillary. Flowers racemose, shortly pedicellate, white or yellow. Fruit pendulous.

612. (1) M. *leucantha* (Koch:) stem erect, branched: leaves ovate-oblong, truncated at the apex, mucronate, remotely serrated: stipules setaceous: racemes elongated, lax: calycine teeth unequal, as long as the tube: corolla (white) more than twice as long as the calyx; the keel and alæ shorter than the vexillum: legumes 2-seeded, ovate, reticulated, with elevated irregular wrinkles: seeds ovate.—*Ser.! in DC.! prod.* 2. *p.* 187; *Wight! cat. n.* 867.—M. altissima, *Thuill.*; *DC. l. c.*; *Wall.! L. n.* 5942.—M. vulgaris, *Willd. enum. p.* 790; *Spr. syst.* 3. *p.* 206.—M. Indica, *Spr.? l. c.*—Trifolium officinale, *β*, *Linn. sp. p.* 1078.—T. Germanicum, *Sm. in Rees' cycl.*

613. (2) M. *parviflora* (Desf.:) stem ascending or erect: branches somewhat petalous: lower leaflets obovate-roundish, and often almost quite entire, upper ones linear or cuneate-oblong, serrated: stipules linear-setaceous, nearly quite entire: flowers (yellow) minute, at first close spiked, afterwards more distant: calycine teeth nearly equal, broad: alæ almost as long as the keel and vexillum: legumes globose-ovoid, irregularly marked with elevated reticulated wrinkles, 2-seeded: seeds ovoid.—*Desf. fl. Atl.* 2. *p.* 192; *Ser.! in DC.! prod.* 2. *p.* 187; *Spr. syst.* 3. *p.* 206; *Wall.! L. n.* 5943.—M. Indicus, *Sm. in Rees' cycl.*—M. minima, *Roth, nov. sp. p.* 361; *DC. l. c. p.* 189; *Spr. l. c. p.* 208.—Trifolium Indicum, *ϑ*, *Linn. sp. p.* 1077; *Roxb. fl. Ind.* 3. *p.* 388; *in E. I. C. mus. tab.* 411.

VIII. CYAMOPSIS. *DC.*

Calyx turbinately-tubular, 5-cleft; lobes lanceolate-subulate, acute, the two upper more remote. Petals nearly equal; the straight acute keel cohering with the oblong alæ, and together falling off elastically: vexillum roundish,

Digitized by Google

remaining after the other petals. Stamens 10, monadelphous. Ovary linear-terete. Style ascending. Stigma capitate. Legume compressed, 2-valved, oblong-linear, rostrate, 2-nerved on the back, close to junction of the valves, with cellular spurious partitions between the seeds. Seeds 7–8, obovate or truncated on one side, compressed. Inner coat of the seed swollen, and resembling albumen.—Annual, erect. Stipules subulate. Leaves pinnately trifoliate: leaflets ovate, dentate, glaucous, exstipulate. Racemes axillary, very short. Flowers small, erect, purplish. Hairs of the whole plant attached by their middle.

614. (1) C. *psoraloides* (DC.)—*DC. prod.* 2. *p.* 216; *Wall.! L. n.* 5920; *Wight! cat. n.* 869.—Dolichos psoraloides, *Lam. enc. meth.* 2. p. 297.—D. fabæformis, *L'Her.; Spr. syst.* 3. *p.* 251; *Roxb. fl. Ind.* 3. *p.* 316.—Psoralea tetragonoloba, *Linn. mant. p.* 104.—Trigonella tetrapetala, *Roxb. in E. I. C. mus. tab.* 413.—Lupinus trifoliatus, *Cav. ic.* 1. *t.* 59.

De Candolle states that the keel consists of two distinct petals: we have always found them combined towards the apex, although distinct at the base.

C. *Stems herbaceous or suffrutescent, often twining: leaves various; primordial ones opposite, similar to each other: stamens usually diadelphous: legume* 1-*celled.*—Clitorieæ. *DC.*

IX. PYCNOSPORA. *Brown mst.*

Calyx without bracteoles, deeply 4-cleft; segments about equal in length, upper one broadest, bifid at the apex. Petals inserted into the bottom of the calyx, about equal in length; vexillum free, broad, rounded: keel obtuse, cohering with the alæ, both free from the stamen-tube. Stamens diadelphous (9 and 1), somewhat persistent: anthers all roundish and perfect. Ovary linear, compressed: ovules numerous, on short slender podosperms. Style glabrous. Stygma obtuse. Legume oblong, inflated, straightish on the seminiferous margin, convex at the dorsal suture, 1-celled: valves scarious, marked with numerous transverse slightly branched and anastomosing veins. Seeds (immature) numerous, small, peritropal, compressed, thickest at the one end. Suffrutescent, diffuse, branched, pubescent. Leaves pinnately trifoliate: leaflets with two partial setaceous stipules, cuneate-obovate, sprinkled with short hairs, more abundantly on the under side where they are paler or slightly glaucous and strongly nerved. Stipules subulate. Racemes terminal, many-flowered, pubescent or hairy: bracteas scarious, striated, ovate-lanceolate with a long subulate point, deciduous. Flowers small, purplish, pedicellate, in pairs or threes from the axil of each bractea. Legumes sprinkled with spreading hairs.

A genus closely allied to *Desmodium* in habit, and to *Crotalaria* in character. We observed the above generic name in the Banksian herbarium, attached to a plant from New Holland, which seems not only to be a congener with the Indian one, but is apparently the same species. As, however, we are not so fortunate as possess the Australian one (*P. hedysaroides*, Brown), we have, to prevent mistakes, derived our description from the Indian and Ceylon species alone.

615. (1) P. *nervosa* (W. & A.)—*Wight! cat. n.* 988.—Crotalaria? nervos *Graham! in Wall.! L. n.* 5428.—Flemingia polysperma, *Moon?*—Courtallum

X. PSORALEA. *Linn.; Lam. ill. t.* 614.

Sepals 5, combined to the middle into a permanent 5-cleft calyx; the tube usually covered with glands; divisions acuminated, the lowest one some-

Digitized by Google

what longer than the others. Stamens 10, usually diadelphous (9 and 1), the tenth sometimes connected with the others at the base. Legume the length of the calyx, indehiscent, 1-seeded, sometimes ending in a beak.—Shrubs or herbaceous plants, usually warted from glandular tubercles. Leaves of various forms. Stipules adnate to the base of the petiole. Inflorescence various. Flowers blue, white or purple.

616. (1) P. *corylifolia* (Linn.:) herbaceous, erect: leaves simple, roundish-ovate, occasionally slightly cordate at the base, repand-toothed: stipules narrow-lanceolate, recurved: racemes dense, spikelike, usually short and capituliform, on long axillary solitary peduncles: pedicels much shorter than the calyx, about three together from each bractea.—*Linn.! sp. p.* 1075; *DC. prod.* 2. *p.* 218; *Spr. syst.* 3. *p.* 198; *Burm. fl. Ind. p.* 172. *t.* 49; *Roxb. fl. Ind.* 3. *p.* 387; *in E. I. C. mus. tab.* 710; *Wall.! L. n.* 5351; *Wight! cat. n.* 840.—Trifolium unifolium, *Forsk.*

Roxburgh defines this species with leaves "rarely ternate," in which state we have never seen it.

XI. INDIGOFERA. *Linn.; Lam. ill. t.* 626; *Gærtn. fr.* 2 *t.* 148.

Calyx 5-cleft; segments acute. Vexillum roundish, emarginate: keel furnished with a subulate spur on both sides, at length often bending back elastically. Stamens diadelphous (9 and 1). Style filiform, glabrous. Legume continuous, one or more seeded, 2-valved. Seeds usually truncated, separated by cellular spurious partitions.—Herbaceous or shrubby. Stipules small, free from the petiole. Peduncles axillary. Flowers racemose, purple, blue, or white; many of the upper ones of each raceme frequently becoming abortive. Leaves various, usually unequally pinnated or digitate: hairs, either all or some of them, adpressed and attached by their middle.

§ 1. Leaves simple: racemes peduncled, few-flowered; pedicels shorter than the calyx: legume crescent-shaped, 3-quetrous, rostrate, 1-seeded; back broad, furnished on each side with a marginal nerve beset with inoffensive slightly hooked prickles.—*Echinatæ.*

617. (1) I. *echinata* (Willd.:) herbaceous, prostrate: branches angular; leaves simple, obovate, minutely dotted with glands: stipules subulate: racemes on peduncles rather shorter than the leaves, few- (6–8-) flowered: calyx-segments long, lanceolate-subulate: keel pointed: legumes crescent-shaped with hooked bristles along the margins of the convex side: seed solitary, flat, reniform.—*Willd. sp.* 3. *p.* 1222; *DC. prod.* 2. *p.* 222; *Spr. syst.* 3. *p.* 273; *Roxb. fl. Ind.* 3. *p.* 370; *Wall.! L. n.* 5456; *Wight! cat. n.* 843. —I. prostrata, *Roxb.! in herb. Sm.!*; *in E. I. C. mus. tab.* 377.—Hedysarum n. 288. *Linn.! in herb. Herm.!*; *fl. Zeyl.*—H. nummulariæfolium, *Linn. sp. p.* 1051 (excl. all syn.).—H. rotundifolium, *Vahl, symb.* 2. *p.* 81.—H. erinaceum, *Poir. enc. meth.* 6. *p.* 393.—Onobrychis rotundifolia, *Desv.; DC. prod.* 2. *p.* 348; *Spr. syst.* 3. *p.* 204.—*Pluk. t.* 433. *f.* 1.——Moist sandy soils, near the coast.

The legume of *Hedysarum cuneifolium* of Roth (*Onobrychis cuneifolia*, DC.) appears to belong to this plant; but we cannot refer the remainder of his description to any of the order with which we are acquainted: perhaps it is drawn up from fragments of different plants.

§ 2. Racemes sessile, short, dense, and somewhat capituliform: flowers almost sessile: legumes 1–2-seeded, globose or short-oblong, the length not exceeding twice the breadth.—*Brachycarpæ.*

618. (2) I. *linifolia* (Retz:) suffruticose, diffuse, procumbent, all over whitish with short adpressed silvery hairs: leaves simple, nearly sessile, from

Digitized by Google

obovate or oblong to lanceolate or narrow linear, mucronate: stipules subulate: racemes very short, sessile, 2–4-flowered: calyx segments long, lanceolate-subulate: legumes globose, 1-seeded: seed perfectly globose, shining.—*Retz, obs.* 4. *p.* 29, *and* 6. *p.* 33. *t.* 2; *DC. prod.* 2. *p.* 222; *Spr. syst.* 3. *p.* 273; *Roxb.! fl. Ind.* 3. *p.* 370; *Cor.* 2. *t.* 196; *Wall.! L. n.* 5489; *Wight! cat. n.* 841. —I. polygonoides, *Wendl.*—Hedysarum linifolium, *Linn.! suppl. p.* 331.—Sphæridiophorum, *Desv. journ.* 3. *p.* 125. *t.* 6. *f.* 35.——Common.

619. (3) I. *cordifolia* (Heyne:) diffuse, all over hairy with long soft white hairs: leaves simple, broadly ovate, slightly cordate at the base, nearly sessile: stipules setaceous: racemes capituliform, sessile, few- (3–6-) flowered: calyx-segments long and subulate: legumes oval, about twice as long as broad, hoary, 2-seeded: seeds ovate and truncated at one end.—*Heyne! in Roth. nov. sp. p.* 357; *DC. prod.* 2. *p.* 222; *Spr. syst.* 3. *p.* 273; *Wight! cat. n.* 842.—Heylandia? cordifolia, *Graham! in Wall.! L. n.* 5343.——Mysore.

620. (4) I. *glandulosa* (Roxb.:) suffruticose, diffuse, young parts softly pubescent or villous: leaves petioled, trifoliolate; leaflets oblong-obovate, rather longer than the petioles, under side more hairy and glandular-dotted: stipules setaceous: racemes sessile, oval, dense, many-flowered, scarcely so long as the petiole: calyx segments short-subulate: legumes oval about twice as long as broad, hairy, 4-angled; angles slightly winged and toothed: seeds 2, ovate and truncated at one end.—*Roxb.! in herb. Sm.!; in Willd. sp.* 3. *p.* 1227; *fl. Ind.* 3. *p.* 372; *DC. prod.* 2. *p.* 223; *Spr. syst.* 3. *p.* 275; *Wall.! L. n.* 5461; *Wight! cat. n.* 846.—I. frumentacea, *Roxb. in E. I. C. mus. t.* 381.——Circars.

621. (5) I. *enneaphylla* (Linn.:) perennial, procumbent, all the young parts and leaves pubescent with adpressed whitish hairs: branches prostrate, two-edged: leaves pinnate, sessile; leaflets 3–5 pairs, obovate-oblong: stipules lanceolate, acuminated, scariose: racemes sessile, short, oval, dense, many-flowered: calyx-segments long-subulate: legumes oval, scarcely twice as long as broad, pubescent, not winged: seeds 2, ovate and truncated at one end.—*Linn.! mant. p.* 272; *DC. prod.* 2. *p.* 229; *Spr. syst.* 3. *p.* 277; *Roxb. fl. Ind.* 3. *p.* 376; *in E. I. C. mus. tab.* 390; *Wall.! L. n.* 5444; *Wight! cat. n.* 863.—I. cæspitosa, *Wight! in Wall.! L. n.* 5447.—Hedysarum prostratum, *Linn.! mant.* 1. *p.* 102; *Burm. Ind. p.* 168. *t.* 55. *f.* 1.—*Pluk. t.* 166. *f.* 2.

§ 3. Leaves sessile; leaflets 3–5: peduncles solitary, filiform, 1-flowered: calyx-segments lanceolate, acute: legumes cylindrical, straight, several- (3–6-) seeded, 4–8 times longer than broad.—*Monanthæ.*

622. (6) I. *aspalathoides* (Vahl:) shrubby, erect, young parts whitish with adpressed hairs: branches slender, numerous, spreading in every direction: leaves sessile, digitately 3–5-foliolate; leaflets narrow-cuneate, small, the upper surface glabrous, under with a few scattered hairs: peduncles solitary, 1-flowered, about the length of the leaves: flowers very small; corolla soon deciduous: legumes cylindrical, pointed, straight, nearly glabrous, 4–6-seeded.—*Vahl in herb. Juss.; DC. prod.* 2. *p.* 231; *Wight! cat. n.* 845.—I. aspalathifolia, *Roxb. fl. Ind.* 3. *p.* 371; *in E. I. C. mus. tab.* 378; *Wall.! L. n.* 5445.—Aspalathus Indicus, *Linn. sp. p.* 1001; *Burm. Ind. p.* 155.—Lespedeza juncea, *Wall.! L. n.* 5743. *b.*—*Pluk. t.* 101. *f.* 6; and 201. *f.* 2; *Rheed. Mal.* 9. *t.* 37.

623. (7) I. *uniflora* (Ham.:) perennial; stems prostrate, slender, long, coloured: leaves sessile, pinnately 3–5 foliolate; leaflets narrow, cuneate-oblong, acute, upper side glabrous, under sprinkled with a few white hairs: peduncles solitary, filiform, 1-flowered, twice the length of the leaves: flowers small: legumes linear-oblong, terete, straight, pointed, nearly glabrous, nearly 4 times as long as broad, about 3-seeded.—*Ham.! in herb. Banks; Roxb. in fl. Ind.* 3. *p.* 374; *in E. I. C. mus. tab.* 1625; *Wall.! L. n.* 5446.

Digitized by Google

§ 4. Leaves pinnated: racemes peduncled few-flowered: flowers very shortly pedicelled, distant; calyx-segments short-subulate: legumes cylindrical, straight, 6–12-seeded.—*Dissitifloræ.*

624. (8) I. *pentaphylla* (Linn.:) suffruticose; decumbent, terete, glabrous except the young parts: leaves pinnated; leaflets 1–2-pairs, oval; both sides but more particularly the under hoary from whitish soft hairs: stipules lanceolate-subulate, hairy: peduncles about the length of the leaves, bearing about 2–3 rather distant flowers: calyx-segments short, subulate: legumes straight, cylindrical, mucronate, glabrous: seeds 10–12, cylindrical, truncated at both ends.—*Linn. syst. veg. p.* 564; *DC. prod.* 2. *p.* 230; *Spr. syst.* 3. *p.* 277; *Wight! cat. n.* 848, 849.—I. fragrans, *Retz, obs.* 4. *p.* 29; *DC. l. c. p.* 229; *Spr. l. c.*; *Roxb.! fl. Ind.* 3. *p.* 375; *in E. I. C. mus. tab.* 386; *Wall.! L. n.* 5452.—I. glabra, *Linn.! sp. p.* 1062; *DC. l. c*; *Spr. l. c.*—I. heterophylla, *Roxb.! in herb. Sm.!*—*Pluk. t.* 166. *f.* 1 (good).

Judging from the description given by Lamarck, we have little doubt but his *I. pusilla* is also this very species. The Linnæan specimen of *I. pentaphylla* is cultivated, but agrees well with wild specimens, and with his own *I. glabra.*

625. (9) I. *viscosa* (Lam.:) suffruticose, erect, much branched; branches, petioles, peduncles, and legumes glutinous, with rigid gland-tipped hairs: leaves petioled, pinnated: leaflets 4–8 pairs, elliptic-oblong, pubescent from white adpressed hairs, particularly on the under side: racemes peduncled about the length of the leaves or longer: flowers distant, small: calyx-segments short-subulate: legumes cylindrical, horizontal, straight: seeds 6–12, cylindrical, truncated at both ends.—*Lam. enc. meth.* 3. *p.* 247; *DC. prod.* 2. *p.* 227; *Spr. syst.* 3. *p.* 278; *Roxb.! fl. Ind.* 3. *p.* 377; *Wall.! L. n.* 5451; *Wight! cat. n.* 847.—I. glutinosa, *Roxb.! in E. I. C. mus. tab.* 387.—I. graveolens, *Roxb.! in herb. Smith.*—Galega Colutea, *Burm. Ind. p.* 172.—*Pluk. t.* 166. *f.* 3 (good).

§ 5. Leaves pinnated: racemes peduncled: flowers almost sessile, approximated at the apex of the peduncle: calyx-segments long and subulate: legumes compressed.—*Planisiliquæ.*

626. (10) I. *tenuifolia* (Rottl.!) herbaceous (annual?), branched, diffuse; branches terete and glabrous below, hairy and somewhat two-edged: leaves short-petioled, pinnated; leaflets about 4 pairs, cuneate-oblong, sprinkled on both sides with adpressed whitish hairs: peduncles longer than the leaves, with a few almost sessile flowers towards the apex: calyx-segments subulate: legumes compressed, pointed, slightly torulose, nearly glabrous; sutures thickened.—*Wight! cat. n.* 864——Mysore; *Heyne.*

§ 6. Leaves trifoliate: racemes nearly sessile, several-flowered, at first corymbiform: pedicels elongated, several times longer than the calyx.—*Laxifloræ.*

627. (11) I. *pedicellata* (W. & A.:) suffruticose, procumbent; branches filiform, sprinkled with short adpressed brownish hairs; older parts terete; young parts compressed, thickly covered with brown glands: leaves petioled, palmately trifoliate; leaflets cuneate-oblong; both sides with short whitish hairs mixed on the under side with glands: racemes almost sessile, somewhat corymbiform, about the length of the leaves: pedicels slender, drooping, 2–3, longer than the calyx: calyx deeply 5-cleft (segments linear and acute), and with the vexillum and keel hirsute and glanduliferous.—*Wight! cat. n.* 868. ——Neelgherries.

A very distinct species, and at first sight apparently not belonging to the genus: but the keel of the corolla is that of *Indigifera.* We have not seen the fruit; the slightly advanced ovary is falcate and pointed.

Digitized by Google

§ 7. Leaves petioled: racemes sessile, short, not so long as the petiole, many-flowered, dense: pedicels much shorter than the calyx: legumes linear, nearly straight, deflexed, several (6–20) times longer than broad, slightly compressed: sutures thickened—*Brachystachyæ*.

628. (12) I. *trifoliata* (Linn.:) suffruticose, branched; branches slender, diffuse, prostrate but ascending at the extremities, glabrous and terete towards the base, two-edged and pubescent upwards: leaves on longish petioles, palmately trifoliolate; leaflets cuneate-obovate, pubescent on both sides, glandular underneath: racemes sessile, shorter than the petioles, dense, many-flowered; flowers minute: calyx-segments long and subulate: legumes straight, deflexed, slightly compressed, somewhat torulose, with a prominent almost winged nerve on each side of the sutures, particularly the seminiferous one; seeds 6–8, cylindrical, truncated at both ends.—*Linn.! amæn.* 4. *p.* 327; *DC. prod.* 2. *p.* 223; *Spr. syst.* 3. *p.* 274; *Wight! cat. n.* 844.—I. prostrata, *Willd. sp.* 3. *p.* 1226; *DC. l. c. p.* 233; *Spr. l. c*; *Roxb. fl. Ind.* 3. *p.* 373. —I. Leschenaultii, *DC.? l. c. p.* 223.—I. multicaulis, *DC. l. c.*—I. canescens, *Spr. l. c.* (not *Lam.*)—I. peregrina, *DC.! prod. l. c. p.* 224.—I. glandulosa, *Roxb. in E. I. C. mus. tab.* 382.—I. Orixensis, *Roxb.! in herb. Smith.*—I. congesta, *Graham! in Wall.! L. n.* 5471.—I. adenophylla, *Graham! in Wall.! L. n.* 5462.—I. canescens, *Graham! in Wall.! L. n.* 5448.—*Pluk. t.* 113. *f.* 8. —Dingygul high hills.

Although the above vary slightly in appearance, they constitute in our opinion but one species: according to the soil the leaves are cuneate-oblong or obovate; to the narrower leaved state may be referred *I. trifoliata*, Linn., *I. prostrata*, Willd., *I. Orixensis*, Roxb., *I. multicaulis*, DC. (with which *I. adenophylla*, Gr. is identical), and part of *I. congesta, a*, Gr.; to the broader leaved the remainder of *I. congesta*, *I. canescens*, Gr., and *I. Leschenaultii*. *I. peregrina*, DC., appears to be a state in which more of the upper flowers in each raceme have become abortive than usual, and seems to be represented in the figure of Plukenet above quoted. *I. Orixensis* of Heyne in Wall. L. n. 5471. *b.* differs in having considerably larger flowers than any of the other specimens, but does not form a distinct species.

629. (13) I. *parviflora* (Heyne:) erect, branched, all over whitish with short adpressed hairs: branches terete below, angled upwards: leaves petioled, pinnated; leaflets 3–4 pairs, oblong-linear: racemes sessile, dense, many-flowered, about the length of the petiole: flowers numerous, minute, the upper ones caducous: calyx-segments subulate: legumes linear, straight except at the point, deflexed, compressed, pubescent, 15–20-seeded: seeds cylindrical, truncated at both ends.—*Heyne! in Wall.! L. n.* 5457; *Wight! cat. n.* 859.——Mysore; *Heyne.* Cunnawady.

§ 8. Leaves petioled, pinnated, sometimes reduced to one or two leaflets: racemes sessile, elongated, many-flowered; pedicels very short: calyx-segments usually short and broad: legumes linear, several times longer than broad, nearly terete or slightly compressed: sutures thickened.—*Tinctoriæ*.

630. (14) I. *paucifolia* (Delile:) shrubby, erect, much branched, all hoary with short adpressed whitish pubescence; branches terete: leaves pinnated; leaflets 1–5, alternate, oblong-lanceolate, the terminal the largest: racemes solitary, sessile, somewhat spiked, longer than the leaves, many-flowered: flowers very small: calyx-segments short and acute: legumes linear, slightly compressed, torulose, pendulous and curved upwards, 5–8-seeded: seeds reniform, flattish, shining.—*Delile, fl. d'Egypt. p.* 107. *t.* 37. *f.* 22; *DC. prod.* 2. *p.* 224; *Spr. syst.* 3. *p.* 273; *Wall.! L. n.* 5454; *Wight! cat. n.* 860, 861.—I. argentea, *Herb. Banks!* (not *Linn.*); *Roxb. fl. Ind.* 3. *p.* 374; *Rottl.! in herb. Smith*; *Wall.! L. n.* 5455.—I. heterophylla, *Roxb.! in E. I. C. mus. tab.* 383.

Digitized by Google

—I. colorata, *Roxb.! in herb. Smith.*—I. anil, *herb. Smith!*—Bremontiera ammoxylon, β Burmanni, *DC. prod.* 2. *p.* 353.—*Burm. Zeyl. t.* 82 (good). ——Tanjore, frequent, in dry arid soil. Rare in the north of the Peninsula.

I. argentea, Linn.! is not found in India: it has the leaflets opposite and legumes much compressed, and is quite distinct from the present species.

631. (15) I. *mysorensis* (Rottl.:) shrubby, erect, branched: branches ascending, terete, hirsutely villous: leaves pinnated: leaflets 1–8-pairs, elliptic-oblong, mucronate, strigose on both sides with adpressed pubescence: racemes sessile, elongated, many-flowered: flowers distant, solitary in the axils of large foliaceous! bracteas: calyx-segments lanceolate: legumes terete, pointed, erect, hirsutely villous, 3–4-seeded; seeds reniform.—*Herb. Heyne!*; *DC. prod.* 2. *p.* 222; *Spr. syst.* 3. *p.* 276; *Wall.! L. n.* 5459.—I. polyphylla, *Herb. Heyne!*.——Mysore; *Heyne.*

Dr Wallich has remarked in his List, "Spreng. vix DC.," which called our attention more particularly to the characters given respectively by these authors; and by a comparison of the specimens in Heyne's herbarium, we are now enabled to account for their apparent discrepancies. In the one series (*I. mysorensis*, Heyne and Wall. L. 5459. *a*), the inflorescence is little advanced, and the specimens well covered with pinnated leaves; there is also a trifoliolate leaf at the base of each raceme. The other series (*I. polyphylla*, Heyne, or Wall. L. n. 5459. *b*), are much more luxuriant, and the racemes have become so much developed as to resemble young branches; the bracteas have enlarged in proportion, and resemble simple leaves. The former corresponds to Sprengel's character: the latter to that given by De Candolle, who probably had only seen the top shoots, for, on the lower part of the specimens we have seen, pinnated leaves are also observable.

632. (16) I. *Wightii* (Graham:) suffruticose, erect, branched, all over hoary with adpressed silky hairs; branches ascending, striated: leaves pinnated; leaflets 5–10-pairs, small, oblong-oval, slightly retuse, mucronate: racemes rather shorter than the leaves, many-flowered: flowers small, crowded, many of them deciduous: calyx-segments short, and acute: legumes few, towards the apex of the rachis, erect, cylindrical, stout, straight, acuminated, 10–12-seeded: sutures prominent: seeds cylindrical, truncated at both ends. —*Graham! in Wall. L. n.* 5458; *Wight! cat. n.* 862. *bis.*—I. foliosa, *Graham in Wall. L. n.* 5485.—I. polyphylla, *herb. Rottl.!*——Madura hills. Mysore; *Heyne.*

The specimens we have from Rottler's herbarium, and marked *I. polyphylla*, although obtained from Heyne, yet differ from those so named by Heyne and distributed by Wallich: Dr Graham informs us that they accord precisely with his *I. foliosa*, which it seems Dr Wallich only had from the Calcutta Bot. Garden: we have not, however, examined the latter; it is probable that it may have been raised from seeds transmitted by Heyne.

633. (17) I. *tinctoria* (Linn.:) suffruticose, erect, branched, sprinkled with short whitish pubescence; branches terete, firm: leaves pinnated; leaflets 5–6-pairs, oblong-obovate, cuneate at the base, slightly decreasing in size towards the apex of the leaf: stipules subulate, erect or incurved: racemes shorter than the leaves, sessile, many-flowered: flowers small, approximated at the base of the raceme, more distant and deciduous towards the apex: calyx-segments broad, acute: legumes approximated towards the base of the rachis, nearly cylindrical, slightly torulose, deflexed and more or less curved upwards: sutures thickened: seeds about 10, cylindrical, truncated at both ends.—*Linn. sp. p.* 1061; *DC. prod.* 2. *p.* 224; *Spr. syst.* 3. *p.* 276; *Roxb. fl. Ind.* 3. *p.* 379; *in E. I. C. mus. tab.* 391; *Wall.! L. n.* 5474; *Wight! cat. n.* 852, 853.—I. Indica, *Lam. enc. meth.* 3. *p.* 245; *ill. tab.* 626. *f.* 1.—I. Sumatrana, *Gærtn. f.* 2. *t.* 148.—*Pluk. t.* 165. *f.* 5 (good); *Rheed. Mal.* 1. *t.* 54 (bad).

Digitized by Google

Rumph. amb. 5. t. 80, usually quoted for this species, is quite different. The form of the legume appears to be variable: De Candolle notices a short fruited variety, with which we are unacquainted, and which probably belongs to the next; Wight! cat. n. 852 has them more straight, short, and thick, than usual, and the leaflets are broader and more glabrous than in his n. 853; but this may probably arise from cultivation. We have not sufficient materials to enable us to determine if *I. Anil* be a distinct species: we know of no distinguishing character unless it is to be found in the fruit; and the descriptions given of that part in the two species differ in different authors.—See DC. prod. 2. p. 225, and Lam. enc. meth. 3. p. 244.

634. (18) I. *cærulea* (Roxb.:) shrubby, erect; branches terete, closely covered with adpressed whitish pubescence: leaves pinnated; leaflets 4–5-pairs, obovate, emarginate, the lower the smaller, the terminal largest; upper surface glabrous; under paler, covered with depressed hairs: racemes solitary, sessile, shorter than the leaves, many-flowered: flowers small, pretty close, the upper ones deciduous: calyx-segments short, acute: legumes terete, short, about 5 times as long as broad, deflexed and falcate upwards, approximated towards the base of the rachis, slightly torulose, 3–4-seeded.—*Roxb.! fl. Ind.* 3. *p.* 377; *in E. I. C. mus. tab.* 358; *Wall.! L. n.* 5460; *Wight! cat. n.* 851. —I. retusa, *Graham! in Wall.! L. n.* 5476.—I. brachycarpa, *Graham! in Wall.! L. n.* 5470.—I. tinctoria, β brachycarpa, *DC.? prod* 2. *p.* 224.——Rajahmundry Circars. Dindygul hills.

We have not seen the seeds: Roxburgh says they are "like those of *tinctoria*."

635. (19) I. *pulchella* (Roxb.:) large erect shrub or small tree, young parts usually whitish with short adpressed hairs; branches angled: leaves pinnated; leaflets 8–10-pairs, obovate or broad elliptic, emarginate, mucronate: racemes about the length of the leaves, sessile, many-flowered, springing from the axils of the leaves and from the former years' leafless branches: flowers large, at first crowded, afterwards more distant: calyx-segments short and acute: petals many times longer than the calyx, patulous and resembling a bilabiate corolla: legumes scattered along the rachis, slightly deflexed, nearly cylindrical, thick, straight, sharp-pointed, 10–12-seeded; sutures callous, thick.—*Roxb. hort. Bengh. p.* 57; *fl. Ind.* 3. *p.* 382; *in E. I. C. mus. tab.* 389; *Wight! cat. n.* 866.—I. purpurascens, *Roxb. fl. Ind.* 3. *p.* 383.—I. cassioides, *Rottl.; DC. prod.* 2. *p.* 225 (char. not good); *Spr. syst.* 3. *p.* 276 (char. good); *Wall.! L. n.* 5468. *d.*—I. verrucosa, *Graham! in Wall.! L. n.* 5469.—I. glaucescens, *Graham! in Wall.! L. n.* 5484.—Leguminosa, *Wall.! L. n.* 5979.——Neelgherries. Dindygul hills. Circar hills.

Of Wall. L. n. 5468, our friend Dr Graham is inclined to refer only the letter *d* to this plant: we have little doubt, however, that *a*, *c*, and perhaps *b*, are quite the same: at least such was our impression when we had the specimens before us. This is the only Peninsular species we know of with large blossoms: perhaps it and the other large flowered ones from Bengal, as *I. violacea*, Roxb., *I. elliptica*, Roxb. (in E. I. C. mus. tab. 1991), *I. arborea*, Roxb. (in E. I. C. mus. tab. 1626), *I. atropurpurea*, Ham. (Roxb. in E. I. C. mus. tab. 1627), and *I. uncinata*, Roxb., ought to form a distinct section.

§ 9. Leaves petioled, pinnated or pinnately trifoliolate: racemes sessile or pedunculed, elongated, many-flowered: pedicels very short: calyx-segments long and subulate: legumes linear, 4-angled from the valves being elevated and almost carinate along their middle, many times longer than broad, many-seeded.—*Tetragonocarpæ.*

636. (20) I. *trita* (Linn.:) herbaceous or suffruticose, erect, rigid, more or less hoary from short adpressed pubescence: leaves pinnately trifoliate; leaflets oval or oblong, mucronate: racemes sessile, about the length of the leaves, many-flowered; flowers small, upper ones deciduous: calyx-segments long and subulate: legumes deflexed or horizontal, closely approximated at

Digitized by Google

the base of the rachis, 4-angled, straight, rigid, and sharp-pointed: seeds numerous (6–10), 4-sided, truncated at both ends.—*Linn.! suppl. p.* 335; *DC. prod.* 2. *p.* 232; *Roxb. fl. Ind.* 3. *p.* 371; *in E. I. C. mus. tab.* 379; *Wall.! L. n.* 5449; *Wight! cat. n.* 856, 857, 858.—I. cinerea, *Willd. sp. p.* 1225; *DC. l. c.*; *Spr. syst.* 3. *p.* 274; *Roxb. fl. Ind.* 3. *p.* 372; *in E. I. C. mus. tab.* 380.—I. canescens, *Lam. enc. meth.* 3. *p.* 251; *Ham.! in herb. Lambert; DC. l. c. p.* 224; *Wall.! L. n.* 5448.—I. ternata, *Roxb.! in herb. Smith* (1789).—I. hedysaroides, *Lam. l. c. p.* 250; *DC. l. c. p.* 232; *Spr. l. c. p.* 275.—I. arcuata, *Willd. l. c. p.* 1228; *DC. l. c.*—I. armata, *Wall.! L. n.* 5453.—I. rigida, *Willd. enum. p.* 780; *DC. l. c. p.* 224.

Rheed. Mal. 9. t. 36, is referred by Lamarck to his *I. hedysaroides*, which is certainly not distinct from *I. trita;* but the habit is considerably at variance; if of this genus, the long pedicels rather point towards our *I. pedicellata*. *I. trita* is a most common plant, found in all soils and situations, and, like all similarly situated plants, presents individual variations that might be esteemed distinct species if examined separately, but which, when viewed collectively, afford no permanent characters.

637. (21) I. *marginulata* (Graham:) shrubby, diffuse, sparingly sprinkled with very short whitish pubescence; branches terete, slender: leaves pinnated; leaflets 1–2-pairs, opposite, elliptic-obovate, the terminal one the largest: stipules subulate, patent: racemes longer than the leaves, sessile, many-flowered: flowers very small, most of them caducous: calyx-segments long and subulate: legumes few, scattered on the rachis, linear, nearly quite straight, slightly drooping, obscurely 4-angled, many-seeded: sutures thickened.—*Graham! in Wall.! L. n.* 5467; *Wight! cat. n.* 865.——Dindygul hills.

638. (22) I. *flaccida* (Koen.:) suffruticose, sparingly covered with adpressed short hairs: stems and branches usually weak, the former terete, the latter angled: leaves pinnated; leaflets 2–3-pair, opposite, oval, acute, bristle-pointed: stipules long, setaceous, erect: racemes peduncled, elongated, twice the length of the leaves: flowers small, recurved, rather distant: calyx-segments long and subulate: legumes scattered on the lower half of the rachis, drooping, long-linear, slender, 4-angled, pointed, many-seeded.—*Roxb.! in herb. Smith; hort. Bengh. p.* 98; *fl. Ind.* 3. *p.* 375; *in E. I. C. mus. tab.* 384; *Wall.! L. n.* 5475; *Wight! cat. n.* 850, 854.—I. scabra, *Roth. nov. sp. p.* 359; *DC. prod.* 2. *p.* 229; *Spr. syst.* 3. *p.* 277.——Samulcottah. Dindygul hills.

This differs from the last by the peduncled racemes, and legumes twice as long in proportion to their breadth.

* 639 (23) I. *Kleinii* (W. & A.:) herbaceous, procumbent: stems terete, glabrous below, sprinkled with adpressed hairs above: leaves pinnated; leaflets alternate, about 9, obovate-oblong, glaucous and strigose beneath: stipules lanceolate, subulate at the point: racemes peduncled, equal to the leaves, many-flowered: flowers small: calyx deeply 5-cleft; segments subulate: legumes crowded, imbricately reflexed, straight, linear, 4-angled, with a subulate rigid straight point: seeds 8–10, 4-sided, truncated at both ends.—*Wight! cat. n.* 855.—I. prostrata, *Klein!*.

From an almost illegible label accompanying the only specimen we have seen, this seems to have been collected in Ceylon.

640. (24) I. *hirsuta* (Linn.:) annual or biennial, erect, branched, everywhere except the leaves covered with soft spreading hairs: leaves pinnated; leaflets opposite, 2–5-pairs, oblong-obovate, the terminal one the largest; upper surface sparingly, the under densely clothed with adpressed silky hairs: stipules long, setaceous: racemes dense, peduncled, elongated, usually longer than the leaves, many-flowered: flowers small: calyx deeply 5-cleft; segments about as long as the corolla, subulate, hairy: legumes imbricately reflexed, straight, 6–8 times as long as broad, 4-angled, mucronate, villous

Digitized by Google

4–6-seeded: seeds 4-sided, truncated at both ends.—*Linn.! sp. p.* 1862; *DC. prod.* 2. *p.* 228; *Spr. syst.* 3. *p.* 276; *Lam. ill. t.* 626. *f.* 3; *Roxb.! fl. Ind.* 3. *p.* 376; *in E. I. C. mus. tab.* 385; *Wall.! L. n.* 5450; *Wight! cat. n.* 862.—*Burm. Zeyl. t.* 14; *Rheed. Mal.* 9. *t.* 30.

I. barbata, Desv. in ann. sc. nat. 9. p. 410, agrees so well in almost every point with our plant, that we feel almost disposed to doubt of the Brazilian locality, and to refer it here.

XII. CLITORIA. *Linn.; Lam. ill. t.* 609; *Gærtn. fr.* 2. *t.* 149.

Calyx 5-cleft, furnished at the base with pretty large very obtuse bracteoles. Vexillum large, rounded. Stamens diadelphous (9 and 1), inserted with the corolla a little above the base (not into the bottom) of the calyx. Style somewhat dilated at the apex. Legume linear, compressed, straight, 2-valved, united with the base of the style, 1-celled, many-seeded, often with cellular partitions between the seeds.—Climbing herbaceous plants. Leaves unequally pinnated: leaflets often 1-pair, more rarely 2–3-pairs, generally furnished with partial stipules at their base. Flowers axillary, pedicellate, large, white or blue or purple, often resupinate.

641. (1) C. *Ternatea* (Linn.:) stem twining, pubescent: leaflets 2–3-pairs, oval or ovate: partial stipules setaceous: peduncles short, axillary, solitary, 1-flowered: bracteoles large, roundish: flowers resupinate: legumes slightly pubescent.—*Linn.! in herb. Herm.!; DC. prod.* 2. *p.* 233; *Spr. syst.* 3. *p.* 256; *Roxb. fl. Ind.* 3. *p.* 321; *in E. I. C. mus. tab.* 408; *Wall.! L. n.* 5344; *Wight! cat. n.* 870.—*Rheed. Mal.* 8. *t.* 38; *Rumph. Amb.* 5. *t.* 31.

XIII. PUERARIA. *DC.*

Calyx campanulate, with two caducous bracteoles at its base, somewhat 2-lipped: the upper lip entire or slightly 2-toothed; the lower trifid. Corolla papilionaceous: keel straight, obtuse: vexillum obovate. Stamens monadelphous below the middle, the tenth often free upwards. Legume flat, compressed, attenuated at the base, pointed with the style, 2-valved, continuous (DC.). Seeds several.—Twining shrubs. Stipules deciduous, free from the petiole. Leaves trifoliolate: leaflets large, ovate, acute, reticulately veined, with partial stipules at their base. Racemes compound, branched. Flowers pedicellate, in pairs or threes.

De Candolle separates this from *Desmodium* on account of the fruit, yet adds, "fructus non satis notus." We consider it doubtful as to species: the original, and perhaps only true one, has perhaps continuous legumes, but, according to Roxburgh, they are much contracted between the seeds.

642. (1) P. *tuberosa* (DC.:) root tuberous, very large: stems woody, twining: leaflets roundish, pubescent above, beneath silky-villous: stipules cordate: racemes simple or branched, the length of the leaves, from the cicatrices of the fallen leaves: flowers (blue) in threes: calyx 4-cleft, silky; segments about equal, ovate, the upper one the broadest and almost entire: legumes very hairy, linear, pointed, 2–6-seeded, much contracted between the seeds.—*DC. prod.* 2. *p.* 240; *Spr. syst. suppl. p.* 275; *Wall.! L. n.* 5352.—Hedysarum tuberosum, *Roxb.! fl. Ind.* 3. *p.* 363; *in E. I. C. mus. tab.* 400; *Willd. sp. p.* 1197.—Kadsumi, *Banks, Icon. Kæmpf. tab.* 25.——Circars.

"A rare species, a native of valleys far up amongst the mountains. It flowers during the hot season, at which time it is perfectly naked of leaves, being deciduous about the beginning of the cold season."—Roxb.

Digitized by Google

XIV. DUMASIA. *DC.*

Calyx cylindrical, obliquely truncated, not toothed, gibbous and with two minute subulate bracteoles at its base. Corolla papilionaceous; the claws of the petals the length of the calyx: limb of the vexillum cordate-oval: keel obtuse. Stamens diadelphous (9 and 1), all fertile. Style filiform at the base and apex, dilated above the middle. Stigma blunt. Legume attenuated at the base, 2-valved, compressed, few-seeded, contracted between the seeds. —Twining herbaceous or suffrutescent plants. Stems terete. Leaves pinnately trifoliolate: leaflets ovate. Racemes axillary. Legumes clothed with a short dense pubescence.

643. (1) D. *congesta* (Graham:) branches, petioles, peduncles, and leaves, shortly villous: leaflets ovate, slightly inclining to lanceolate: racemes longer than the leaves, many-flowered: alæ and keel strongly cohering for a little space by their limb.—*Graham! in Wall.! L. n.* 5524; *Wight! cat. n.* 749.—— Neelgherries.

We can scarcely point out a character to separate this from *D. villosa* of De Candolle, unless that our species has always the adult leaves more or less villous instead of being nearly glabrous, as in the other. The length of the legume is not sufficiently constant to afford characters.

XV. GALACTIA. *P. Browne.*

Calyx with 2 small acute bracteoles at its base, 4-cleft; segments acute, nearly equal. Corolla papilionaceous: petals oblong (always?), 5, distinct or the keel-petals slightly cohering at the apex; vexillum incumbent, broader than the others. Stamens diadelphous (9 and 1), all fertile. Legume terete or compressed, several-seeded, 2-valved, 1-celled, elongated.—Shrubby, suffruticose, or herbaceous twining plants. Leaves pinnated: leaflets 1 or more pairs with an odd one, with partial stipules at their base. Racemes axillary.

That the following ought to be united to the genus we have some doubts: but we believe that very similar species from the West Indies are referred here by authors. The legume is flat, coriaceous, and nearly that of *Clitoria*. They may at all events form a subgenus.

Sub-Gen. CAMPESIA. Stems twining, filiform, terete: leaves pinnately trifoliolate: leaflets slightly coriaceous, mucronate, prominently reticulated with veins: racemes longer than the leaves, interrupted: flowers 2–4 together: calyx 4-cleft; segments lanceolate-subulate, convolute and flexuose by drying; lateral ones the smaller; upper one the longest: alæ shorter than the vexillum and keel: style glabrous, nearly acute: legumes erect, compressed, pubescent, 4–8-seeded, with cellular partitions between the seeds.

644. (1) G. *tenuiflora* (W. & A.:) branches slightly pubescent: leaflets from oval to oblong-lanceolate; upper side glabrous, shining; under with adpressed pubescence: calyx nearly glabrous, campanulate.—*α*; leaflets narrower, oblong or oblong-lanceolate, slightly retuse at the base.—*Wight! cat. n.* 874.—Glycine tenuiflora, *Willd. sp.* 3. *p.* 1059; *DC. prod.* 2. *p.* 241; *Roxb. fl. Ind.* 3. *p.* 319; *Wall.! L. n.* 5509. *a.*—G. lucida *Graham! in Wall.! L. n* 5511.—Teramnus tenuiflorus, *Spr. syst.* 3. *p.* 235.—Robinia filiformis, *Roxb. in E. I. C. mus. tab.* 406.—*β*; leaflets oval or oblong-oval, the terminal one roundish-cuneate at the base.—*Wight! cat. n.* 875.——Colemala.

A species before us (*G. longiflora*, herb. Arn.) from St Vincent's, approaches to our var. *β*, but the leaflets are all retuse or rounded at the base, the calyx

Digitized by Google

tubular, and the corolla about an inch long; while in *G. tenuiflora*, as well as in the following species, it is not half an inch.

645. (2) G. *villosa* (W. & A.:) branches more or less villous: leaflets oval, obtuse, or slightly retuse at both ends; upper side softly pubescent, under villous: calyx softly hairy, campanulate.—*Wight! cat. n.* 939.—Glycine tenuiflora, *Wall.! L. n.* 5509, *b, c.*—G. filiformis, *Wall.! L. n.* 5510. (partly).

When the leaves are old, they become much more glabrous, especially those near the root; but *G. tenuiflora* has them villous at no period.

XVI. SHUTERIA. *W. & A.*

Calyx 4-cleft; segments acuminated, entire, the inferior and superior longer than the lateral ones: bracteoles 2 at the base of the calyx, scarious, subulate, and nearly the length of the tube. Corolla papilionaceous, twice the length of the calyx: petals long-unguiculate: keel of one piece, shorter than and free from the alæ: vexillum without callosities, the margins bent back. Stamens diadelphous (9 and 1) all fertile. Style compressed, glabrous, elongated, after flowering somewhat flexose. Stigma capitate. Legume linear, compressed, hairy, continuous, 5–6-seeded, with cellular partitions between the seeds.—Twining. Branches, petioles and racemes covered with spreading hairs. Stipules and bracteas lanceolate, scariose, striated. Leaves pinnately trifoliolate: leaflets with subulate partial stipules at the base: lateral ones ovate or oval, terminal one rhomboidal. Racemes axillary, shorter than the leaves, many-flowered: flowers pedicellate.

This appears, at first sight, so closely allied to the next, that we were only satisfied of their being distinct genera by the aid of the microscope: the inflorescence, however, in the two and the nervation of the leaflets are altogether different. So far as we can judge from the description and figure, *Glycine involucrata*, Wall. pl. As. rar. 3. p. 22. t. 241, is a species of *Shuteria*.

646. (1) S. *vestita* (W. & A.) leaflets slightly hairy on both sides, but particularly beneath, slightly acute and evidently mucronate, lateral ones ovate: flowers 2 or more from each bractea: calyx very hairy.—*Wight! cat. n.* 873.—Glycine vestita, *Graham! in Wall.! L. n.* 5512.—Dindygul hills, at an elevation of 2500 feet.

647. (2) S. *glabrata* (W. & A.:) leaflets glabrous on both sides, sprinkled with spreading hairs along the margin, obtuse, inconspicuously mucronate; lateral ones oval: flowers solitary from each bractea: calyx glabrous or sprinkled with a very few hairs.—*Wight! cat. n.* 992.—Cunnawady.

XVII. NOTONIA. *W. & A.*

Calyx deeply 5-cleft; segments slender, subulate, nearly equal, the lower one slightly the longest, the two upper combined to above the middle: bracteoles 2, subulate, as long as the calyx, situated immediately below its base. Corolla papilionaceous, shorter than the calyx: vexillum oblong-obovate, without callosities, nearly twice the length of the other petals: keel of one piece, obtuse, free from the alæ. Stamens diadelphous (9 and 1), all fertile. Style ensiform, glabrous, attenuated upwards. Stigma capitate. Legume linear, pointed with the base of the style, hairy, 4–5-seeded, with cellular partitions between the seeds. Seeds flattish, peritropal.—Twining suffrutescent plants. Stems, petioles, and peduncles, covered with reflexed brownish hairs. Stipules lanceolate, scarious, striated. Leaves pinnately trifoliolate: leaflets more or less clothed with adpressed hairs, roundish or ovate, cuneiform and

Digitized by Google

3-nerved at the base; the nerves beneath and margin villous: partial stipules 2, subulate, below the base of the leaflets. Racemes axillary; at first dense, short, and comose (from the length of the subulate hairy bracteas, bracteoles and calyx-segments); afterwards much elongated and distant-flowered, particularly in the lower part. Legumes reflexed.

This and the last genus we have named respectively after Mr Noton (to whom the botany of the Neelgherry hills owes much), and the late Dr Shuter, naturalist on the Madras establishment. Perhaps we may be censured for creating two genera on apparently so slight characters as we have given; and had the Linnæan genus *Glycine* been kept entire, we would have referred them there, but that has long ago been broken up, and the definitions given to each of the separated portions will not accord with either of our two. Dr Graham has referred the present to *Soja*, but the fruit, which he had probably not seen, is much at variance, and brings it to the group of the *Clitoriæ*.

648. (1) N. *Wightii* (W. & A.:)—*α*; hairs on the stems shorter and more deflexed: calyx-segments and corolla longer.—*Wight! cat. n.* 871.—Soja Wightii, *Graham! in Wall.! L. n.* 5530.—*β*; hairs on the stems longer and almost horizontal; calyx-segments and corolla shorter.—*Wight! cat. n.* 872.—Soja javanica, *Gr.! in Wall.! L. n.* 5528.—Glycine javanica, *Linn.?*; *herb. Heyne.*——Dindygul hills. Mysore. Colemala.

XVIII. GLYCINE. *Linn.* (partly).

Calyx somewhat bilabiate; upper lip bifid; lower trifid, more deeply cleft than the upper: segments lanceolate, acute. Bracteoles 2 at the base of the calyx, short, lanceolate. Corolla papilionaceous: vexillum without callosities, emarginate, the sides bent back: keel never spirally twisted, obtuse, of one piece, free from the alæ, and shorter than them and the vexillum. Stamens 10, monadelphous, 5 alternately shorter, and occasionally without anthers; tube cleft in front. Ovarium oblong, obtuse. Style short, slightly curved, glabrous. Stigma slightly capitate, pruinose. Legume linear, compressed-cylindrical, nearly straight, ending in a shortish bent-up rigid point (the thickened and hardened base of the style), 2-valved, many-seeded, continuous with cellular partitions between the seeds: valves convex.—Herbaceous or suffrutescent, twining, more or less hairy plants. Stems covered with short reflexed hairs. Stipules lanceolate, small. Leaves pinnately trifoliolate: leaflets with 2 minute setaceous partial stipules near their base. Racemes axillary, interrupted: flowers pinkish, 2–3 together, the fascicles rather distant.

We have presumed to alter the generic character given by De Candolle, in order to include almost the only Linnæan species he enumerates; but indeed we have never seen a plant agreeing with the definition in his Prodromus, and Mémoires sur les Legumineuses: it seems to have been drawn up from different species; the diadelphous stamens, the filiform style, and the legume without partitions, belonging probably to more than one genus, while the hooked mucro above refers to the Linnæan *G. labialis*.

649. (1) G. *labialis* (Linn.:) stems slightly hairy: leaflets ovate-oblong, slightly coriaceous; upper side glabrous and shining; under pale green, sparingly hairy: calyx with short adpressed whitish hairs: legumes with short adpressed pubescence, short-pointed.—*Linn.! suppl. p.* 325; *Roxb. fl. Ind.* 3. *p.* 318; *Wight! cat. n.* 877.—G. pentandra, *Roxb. in E. I. C. mus. tab.* 407.—C. debilis. *Ait.*; *DC. prod.* 2. *p.* 241.—G. parviflora, *Lam. enc. meth.* 2. *p.* 738; *DC. l. c. p.* 242; *Wall.! L. n.* 5508 (exclud. *h*, *g* partly).—G. filiformis, *Wall.! L. n.* 5510 (partly).—G. pallens, *Graham? in Wall. L. n.* 5518.—Teramnus labialis, *Spr. syst.* 3. *p.* 235.—T. parviflorus, *Spr. l. c.*

Digitized by Google

Roxburgh describes and figures this diadelphous: we have uniformly found it monadelphous, and almost always with five of the anthers represented by mere glands. "Wings projecting, horizontal, hiding the keel, which makes the flowers appear two-lipped rather than papilionaceous."—ROXB.

650. (2) G. *mollis* (W. & A.:) stems clothed with long hairs: leaflets broadly ovate or elliptical, thin; upper side sprinkled with longish, under with short adpressed hairs: calyx about the length of the corolla, very hairy; hairs on the tube patent, on the segments erect: legumes with short adpressed pubescence, long-pointed.—*Wight! cat. n.* 876.—G. parviflora, *var.* mollis, *Graham! in Wall.! L. n.* 5508. *g* (from Prome), *h.*

XIX. PSEUDARTHRIA. *W. & A.*

Calyx obscurely 2-lipped to about the middle: upper lip bifid: lower 3-partite, the middle segment the longest. Corolla papilionaceous: petals nearly equal in length; vexillum roundish; keel obtuse. Stamens diadelphous (9 and 1). Ovarium hairy; ovules several, attached by longish podosperms. Style filiform, shortish. Stigma capitate. Legume continuous, 1-celled, membranaceous, transversely reticulated with veins, covered with hooked hairs, flat, linear, roundish at the apex with a short point about its middle. Seeds alternate, compressed, somewhat reniform.—Diffuse or erect perennial plants, with the habit of *Desmodium*. Leaves pinnately trifoliolate: leaflets when young, very villous on the under side, with two subulate partial stipules on the petioles a little below their base. Stipules lanceolate-subulate, scariose, striated. Racemes axillary or terminal, simple or branched. Flowers purple, in threes from each bractea (the middle one usually abortive), on longish pedicels, jointed close under the calyx with the pedicel, and easily breaking off from it.

Of this genus we have received another species from our friend Dr Hooker, marked as cultivated in the Mauritius, from Zanzebar. In it, which we propose to name *P. Hookeri*, the stem appears erect; the lateral leaflets are elliptic, the terminal one oblong-ovate; all hispid on the upper side, and densely villous on the under; the racemes are short; bracteas lanceolate-subulate like the stipules; and legumes 6–8-seeded, and about 8 times longer than broad. From the mere glance we had of *Rhynchosia pilosa*, Wall. L. n. 5499, it likewise appears to be a congener.

651. (1) P. *viscida* (W. & A.:) diffuse, prostrate; lateral leaflets obliquely ovate, terminal one rhomboid-ovate, pubescent on the upper surface, when old shortly villous on the under: racemes filiform, elongated: bracteas subulate: legumes 3–4-seeded, 3–4 times longer than broad.—*Wight! cat. n.* 829.—Hedysarum, no. 295, *Linn.! in herb. Herm.* and *fl. Zeyl.*—H. viscidum, *Linn.! syst. pl.* 3. *p.* 506; *Roxb.! fl. Ind.* 3. *p.* 356.—H. prostratum, *Roxb. in E. I. C. mus. tab.* 404.—Desmodium viscidum, *DC. prod.* 2. *p.* 336; *Wall.! L. n.* 5698.—Rhynchosia viscida, *DC. l. c. p.* 387.—Glycine viscida, *Willd. in nov. act. nat. cur.* 4. 1803, *p.* 208; *Pers. syn.* 2. *p.* 300; *Spr. syst.* 3. *p.* 196.—*Burm. Zeyl. t.* 84. *f.* 1.

D. *Stems herbaceous, shrubby, or arborescent: primordial leaves either alternate or opposite, dissimilar, the one simple, the other pinnated: stamens diadelphous, more rarely monadelphous: legumen continuous.* Galegeæ, *Brown.* *

XX. TEPHROSIA. *Pers.*

Calyx without bracteoles, about equally 5-toothed or 5-cleft. Vexillum

* We have here omitted, although belonging to the Galegeæ, *Colutea Wightiana*, Graham! in Wall.! L. n. 5921, it being a cultivated plant, and the same with *Sutherlandia frutescens* of Brown.

Digitized by Google

large, roundish, usually silky or pubescent on the outside, spreading or reflexed: keel obtuse, cohering with the alæ. Stamina variously united, monadelphous, or diadelphous, the upper filament sometimes half-united with the others. Style filiform. Stigma terminal. Legume generally sessile and flatly compressed, linear, many-seeded: valves usually flat. Seeds compressed.—Shrubs or herbaceous plants, erect, or rarely climbing? Stipules free from the petiole, lanceolate or subulate, never sagittate. Leaves unequally pinnated, sometimes reduced to a single leaflet. Racemes terminal, axillary, or opposite to the leaves. Flowers white or purplish.

T. pulchra, Graham! in Wall. L. n. 5630, appears to us a species of *Dalbergia* (*D. tephrosioides*, W. & A.)

§ 1. *Racemes erect, often panicled: calyx truncated or shortly 5-toothed: stamens monadelphous: legumes sometimes torulose.*—Mundulea, *DC.*

652. (1) T. *suberosa* (DC.:) arborescent, erect, branched; ends of the branches and young shoots tomentose: bark corky, cracked: leaves pinnated; leaflets 6–10 pair, elliptic-oblong, obtuse, mucronulate; upper side almost glabrous and somewhat shining; under clothed with a silky adpressed pubescence: racemes terminal; flowers large, in pairs, long-pedicelled: calyx campanulate, shortly 5-toothed: keel straightish; vexillum pubescent: style glabrous: legume long, straight, silky-pubescent, irregularly contracted between the seeds.—*DC. prod.* 2. *p.* 249; *Spr. syst. suppl. p.* 274; *Wall.! L. n.* 5628: *Wight! cat. n.* 882, 883.—T. sericea, *DC. l. c.* (not *Pers.* nor *DC. l. c. p.* 255); *Wall.! L. n.* 5629.—Cytisus sericeus, *Willd. sp.* 3. *p.* 1121; *Spr. syst.* 3. *p.* 225.—Robinia suberosa, *Roxb. fl. Ind.* 3. *p.* 327; *in E. I. C. mus. tab.* 1275.—R. sennoides, *Roxb. fl. Ind.* 3. *p.* 328.——Alpine valleys in Mysore, Madura, Tinnevelly, and northern Circars (not in Tranquebar).

*653. (2) T. *candida* (DC.:) shrubby, erect, branched; young shoots villous: leaves pinnated; leaflets 9–11 pair, oblong-lanceolate, acute, mucronate; upper side glabrous; under pale, with adpressed silky hairs: racemes terminal or axillary, usually short and few-flowered, sometimes more elongated: flowers large, drooping, on longish pedicels, fascicled: calyx campanulate, shortly 5-toothed: keel falcate towards the apex; vexillum silky: style hairy, bent into a right angle: legume linear, very compressed, slightly curved, long-pointed, clothed with rusty adpressed pubescence.—*DC. prod.* 2. *p.* 249; *Spr. syst. suppl. p.* 274; *Wall.! L. n.* 5627; *Wight! cat. n.* 886.—Robinia candida, *Roxb. fl. Ind.* 3. *p.* 327; *in E. I. C. mus. tab.* 1274.—Galega arborescens, *herb. Madr.!*——Missionaries Garden (introduced from the Peninsula?).

654. (3) T. *fusca* (W. & A.:) shrubby, erect, branched; branches and young parts tomentose: leaves pinnated; leaflets 6–9 pair, oblong-linear, obtuse at both ends, mucronate; upper side pubescent; under woolly: stipules lanceolate: racemes terminal, short: flowers in pairs, longish pedicelled, some of the lower ones axillary: calyx villous, campanulate, 5-cleft; segments shortish, broad: legume linear, compressed between the seeds, slightly curved, long-pointed, copiously clothed with adpressed silky hairs.—*Wight! cat. n.* 885.—T. argentea, *Wight! in Wall.! L. n.* 5648 (not *Pers.*)——Dindygul hills.

The whole plant is of a dark or dirty-grey colour.

655. (4) T. *racemosa* (W. & A.:) shrubby, climbing: bark scabrous: leaves pinnated; leaflets 6 pair, oval, acute, glabrous: stipules subulate: racemes axillary, many-flowered, long, rather shorter than the leaves: flowers large, solitary: calyx campanulate, slightly 5-toothed: vexillum emarginate; alæ falcate: ovary surrounded at the base by a cup-shaped crenulated tube:

Digitized by Google

legumes straight, drooping, torulose, flat between the seeds: seeds 5–6 distant.—Robinia racemosa, *Roxb. fl. Ind.* 3. *p.* 329.—R. Galuga, *Roxb. in E. I. C. mus. tab.* 300.——Forests in the Circar mountains.

This species we have characterised from Roxburgh's description and drawing: he represents the stamens diadelphous, but this may be a mistake, as he does the same in some other of his species of *Robinia*, where they are certainly monadelphous. Dr Graham in Wall. L. n. 5914, refers it to his *Pongamia racemosa*, from which genus the fruit removes it very widely.

§ 2. *Calyx segments linear-subulate: stamens either monadelphous or diadelphous: legumes flat.*—Reineria, *Mœnch.*

656. (5) T. *tinctoria* (Pers.:) shrubby, erect, branched, everywhere except the upper surface of the leaves clothed with a silky white or fulvous tomentum: branches flexuose: stipules linear-lanceolate: leaves pinnated; leaflets 1–6 pairs, or occasionally reduced to the terminal leaflet, oblong-oval, terminal one longest, the lower pair at the base of the petiole and smaller than the others; upper side glabrous, under white and tomentose: peduncles usually longer than the leaves, axillary, erect, bearing a short spike-like raceme at the apex: calyx-segments subulate: flowers small, on pedicels shorter than the bracteas: vexillum silky: legumes flat, nearly straight, spreading, unilateral, 8–12-seeded.—*Pers. syn.* 2. *p.* 329; *DC. prod.* 2. *p.* 252; *Spr. syst.* 3. *p.* 233.—T. hypargyrea, *DC. l. c. p.* 253; *Spr. syst. suppl. p.* 274.—T. nervosa, *Pers. l. c., p.* 328; *DC. l. c. p.* 254.—*α*; branches shorter, more rigid: hairs on the young parts fulvous: leaflets shorter, smaller, half an inch to an inch and quarter long, more coriaceous.—*Wight! cat. n.* 887, 888, 890.—T. Heyneana, *Wall.! L. n.* 5631. *d, f.*—T. intermedia, *Graham! in Wall.! L. n.* 5632.—Cracca, n. 302, *Linn.! in herb. Herm.!; fl. Zeyl. p.* 141.—Galega tinctoria, *Linn. sp. p.* 1063.—*β*; branches longer, more pliant: hairs on the young parts soft, and white: leaves usually pinnated; leaflets long, an inch and a half to three inches long, thinner.—*Wight! cat. n.* 889, 891.—T. Heyneana, *Wall.! L. n.* 5631. *a, b, c, e.*—Galega Heyneana, *Roxb. fl. Ind.* 3. *p.* 384; *in E. I. C. mus. tab.* 1629.—*γ*; leaves simple; lateral leaflets wanting.—*Wight! cat. n.* 881.—T. Grahamii, *Wall.! L. n.* 5652.——*α*, Dindygul hills. Neelgherries.—*β*, *γ*, Mysore.

The Linnæan plant in Hermann's herbarium belongs to our variety *α*, and corresponds precisely with Wight's cat. n. 887; Roxburgh's drawing and specimen of his *Galega Heyneana* is n. 891. A most beautiful but very variable species: our specimens exhibit all the different gradations from simple leaves to 6 pairs of leaflets; indeed one individual before us has one leaf simple, while all the others are pinnated. *T. Grahamii* (Wight's cat. n. 881), seems always to have simple leaves, and they are occasionally more acute than in any of the other states; but on it, other leaves present precisely the same form as the accidental simple leaves in Wight's cat. n. 891, (corresponding to Wall. L. n. 5631. *a, c.*) All the above forms agree with the character we have given; the nervation and texture is the same: we have even found it almost impossible to separate them into varieties. *T. coccinea*, Wall.! L. n. 5633, differs principally from our species by the leaflets being obovate-retuse, and the raceme itself elongated. *T. brachystachya*, DC., appears to be closely allied, but the character given presents a very indefinite idea of the species.

* 657. (6) T. *senticosa* (Pers.:) shrubby, diffuse, nearly glabrous: leaves pinnated: leaflets 1–3 pairs, obcordate, the terminal one the largest: upper side glabrous, under whitish with a very fine pubescence: stipules subulate: flowers in pairs, axillary, towards the extremities of the branches, nearly sessile: calyx-segments subulate: legumes compressed, glabrous, slightly curved at the point.—*Pers. syn.* 2. *p.* 330; *DC. prod.* 2. *p.* 255; *Spr. syst.* 3. *p.* 233.

Digitized by Google

—Cracca, n. 303, *Linn.! in herb. Herm.!; fl. Zeyl. p.* 141.—Galega senticosa, *Linn.! amæn.* 3. *p.* 19.

We have introduced this although only known hitherto as a Ceylon plant, as it is most probably found likewise on the Peninsula. Our character is derived entirely from the original specimens in Hermann's herbarium; we have suspicions, however, that the legumes may be sometimes more pubescent, and the leaves more silky beneath, when *T. biflora*, DC., or *Galega biflora*, Poir., might be referred to it.

658. (7) T. *Hookeriana* (W. & A.:) shrubby, diffuse; branches, petioles, and peduncles tomentose: leaves pinnated; leaflets 5–7 pairs, from oval to oblong-obovate; upper side softly pubescent; under strongly marked with veins, clothed with silvery hairs: stipules short-lanceolate, erect: racemes terminal, elongated, interrupted, many-flowered: flowers fascicled, nearly sessile: calyx covered with short white tomentum, campanulate, 5-cleft: segments lanceolate-subulate, the length of the tube: vexillum silky: legumes linear, nearly straight, drooping, softly and densely pubescent, acuminated at the point.—*Wight! cat. n.* 884.—T. Colutea, *Wight! in Wall.! L. n.* 5647 (not *DC.*)——Trichinopoly.

659. (8) T. *incana* (Graham:) shrubby, diffuse, every where except the upper surface of the leaves tomentose or woolly: leaves pinnated; leaflets about 6 pair, obovate, retuse; upper side pubescent or silky, under woolly: stipules lanceolate, reflexed: racemes terminal, elongated, interrupted, many-flowered: flowers fascicled, almost sessile: calyx villous, with long fulvous hairs; segments subulate, several times longer than the tube: vexillum silky: legumes deflexed and falcately curved upwards, obtuse, densely fulvous-woolly, 6–8-seeded.—*Graham! in Wall.! L. n.* 5644; *Wight! cat. n.* 938.—T. Colutea, *DC.? prod.* 2. *p.* 252; *Spr.? syst.* 3. *p.* 233.—Galega incana, *Roxb.! fl. Ind.* 3. *p.* 388; *in E. I. C. mus. tab.* 1628.—Galega Colutea, *Willd.? sp.* 3. *p.* 1246 (excl. syn.)—G. villosa, *Ham. in Linn. soc. trans.* 13. *p.* 547.

Our specimens agree with Roxburgh's figure and description, and hence we have adopted the specific name *incana*. This seems, however, to be also *Galega colutea* of Willdenow, but he does not appear to have seen the legumes, that part of his character being derived from Burmann, whose description again is obviously taken up, not from specimens, but from Plukenet's figure, which belongs to *Indigofera viscosa*. *Teph. Colutea* of Persoon, De Candolle, and Sprengel, has been adopted entirely from Willdenow, so that the erroneous description of the legume is found in all these authors.

660. (9) T. *argentea* (Pers:) shrubby, diffuse and almost prostrate, stems and branches clothed with white cottony hairs: leaves pinnated; leaflets 6–8 pair, cuneate-oblong, obtuse or retuse; upper side scarcely pubescent; under white with long adpressed silky hairs, inconspicuously marked with veins: stipules lanceolate-subulate, patent or reflexed, rigid: racemes terminal, interrupted, many-flowered: flowers fascicled, shortly pedicelled: calyx white-villous, deeply 5-cleft; segments subulate, 2–3 times longer than the tube, lower one the longest: legume drooping and curved upwards, linear, obtuse, white-woolly, about 6-seeded.—*Pers. syn.* 2. *p.* 329; *DC. prod.* 2. *p.* 252; *Spr. syst.* 3. *p.* 233; *Wight! cat. n.* 893.—T. villosa, *Wall.! L. n.* 5645. *a* (partly, in herb. Graham).—Galega argentea, *Lam. enc. meth.* 2. *p.* 599. —G. barba-jovis, *Burm. fl. Ind. p.* 172.

661. (10) T. *villosa* (Pers.:) shrubby, diffuse, flexuose: branches, petioles, and peduncles, hoary with silky pubescence, or sometimes slightly tomentose: leaves pinnated; leaflets 6–8 pair, narrow cuneate, obtuse or retuse; upper side nearly glabrous; under strongly striated with veins, more or less copiously sprinkled with short adpressed silvery silky hairs: stipules lanceolate-subulate, reflexed: racemes terminal, elongated, interrupted, many-flowered: flowers fascicled, almost sessile: calyx villous, deeply cleft; seg-

Digitized by Google

ments subulate, several times longer than the tube: vexillum silky: legumes deflexed, and falcately curved upwards, obtuse, woolly (fulvous or white), 6–8-seeded.—*Pers. syn.* 2. *p.* 329; *DC. prod.* 2. *p.* 251; *Spr. syst.* 3. *p.* 233; *Wall.! L. n.* 5645; *Wight! cat. n.* 892, 894.—Cracca, *n.* 299, *Linn.! fl. Zeyl. p.* 139.—G. villosa, *Linn. sp. p.* 1063; *Roxb.! fl. Ind.* 3. *p.* 387.—G. hirta, *Ham. in Linn, Soc. Trans.* 13. *p.* 546.—*Pluk. t.* 59. *f.* 6. (from a poor specimen); *Burm. zeyl. t.* 33. (good).

Perhaps this and the two last are varieties of one species; their aspect is more different than might be inferred from the characters.

662. (11) T. *diffusa* (W. & A.:) shrubby, diffuse, procumbent, slender, villous: leaves pinnated; leaflets 5–10 pair, cuneate, retuse, clothed with long adpressed hairs, particularly on the under side: stipules subulate: racemes opposite to the leaves, at first very short, afterwards more elongated and with a small leaf at each pair of flowers: flowers small: calyx hairy, deeply 5-cleft; segments long, setaceous: vexillum hairy: legumes ascending, linear, nearly straight, compressed, more or less hairy.—*Wight! cat. n.* 895.—T. parviflora, *Wight! in Wall.! L. n.* 5642.—Galega diffusa, *Roxb. fl. Ind.* 3. *p.* 387.—G. procumbens, *Ham. in Linn. soc. trans.* 13. *p.* 547.—G. prostrata, *Koen.; herb. Madr.!—Pluk. t.* 52. *f.* 1. (good).

663. (12) T. *purpurea* (Pers.:) shrubby, somewhat erect, much branched; branches glabrous, pubescent, or slightly villous: leaves pinnated; leaflets cuneate-oblong or lanceolate; upper side usually glabrous, under more or less pubescent: stipules subulate from a broad base: racemes leaf-opposed, peduncled, often longer than the leaves, many-flowered: flowers on pedicels longer than the bracteas, 2–3 together: calyx pubescent; segments about the length of the tube, subulate: corolla about 3 times the length of the calyx tube; vexillum silky, bent back from near its base: legumes slightly compressed, spreading, linear, slightly falcate, obtuse with a short point, at length pubescent or glabrous.—*α*; leaflets cuneate, retuse.—*Wight! cat. n.* 897, 898.—T. purpurea, *Pers. syn.* 2. *p.* 329; *DC. prod.* 2. *p.* 251; *Spr. syst.* 3. *p.* 233; *Wall.! L. n.* 5638.—T. stricta, *Graham! in Wall.! L. n.* 5639.—T. Wallichii, *Graham! in Wall.! L. n.* 5640.—T. lobata, *Graham! in Wall.! L. n.* 5646.—T. Taylorii, *Graham! in Wall.! L. n.* 5637.—T. tinctoria, *Graham! in Wall.! L. n.* 5643.—T. galegioides, *Graham! in Wall.! L. n.* 5649.—T. lanceæfolia, *Link. enum.* 2. *p.* 252; *DC. l. c.*—Cracca, n. 301, *Linn.! in herb. Herm.!; fl. Zeyl. p.* 140.—Galega purpurea, *Linn. sp. p.* 1063; *Roxb.! fl. Ind.* 3. *p.* 386.—G. Colonila, *Ham. in Linn. soc. trans.* 13. *p.* 545.—G. sericea, *Ham.! l. c., p.* 544.—G. tinctoria, *Lam. enc. meth.* 2. *p.* 598. (not *Linn.*); *Roxb. l. c.—Burm Zeyl. t.* 32; *Rheed. Mal.* 1. *t.* 55.—*β*; leaflets oblong-lanceolate.—*Wight! cat. n.* 899.—T. lanceolata, *Graham! in Wall.! L. n.* 5636.—Galega lanceæfolia, *Roxb. fl. Ind.* 3. *p.* 386.—G. cœrulea, *herb. Rottl.!*——*α*, very common.—*β*, Circars.

The supposed type of this species has the whole plant, especially the stems and legumes, almost glabrous; but we have observed so many transitions between that state and those in which the stems might almost be called villous and the legumes decidedly pubescent, and forms as variable as the soil in which this species is found, that we have been induced to neglect the pubescence as a character insufficient to mark a variety. To the more or less pubescent state, may be referred Wight's cat. n. 898 (partly), *T. purpurea*, Wall. L. n. 5638. *b* (partly), *T. stricta*, Gr., *T. lobata*, Gr., *T. tinctoria*, Wall., and to the more densely pubescent or slightly villous Wight's cat. n. 898 (partly), *T. Wallichii*, Gr., and *T. galegioides*, Gr.

664. (13) T. *maxima* (Pers.:) shrubby, diffuse, procumbent; stems glabrous or sprinkled with spreading hairs: leaves pinnated; leaflets cuneate, emarginate; upper side glabrous, under thinly pubescent: stipules lanceolate-subulate, reflexed: racemes leaf-opposed, elongated, interrupted, bearing usually a leaf at each of the lower fascicles of flowers: flowers on pedicels

Digitized by Google

longer than the bracteas, about 3 together: calyx pubescent; segments setaceous, about the length of the tube: corolla 5–6 times longer than the calyx tube; vexillum silky, straight to near the apex: legumes almost flat, spreading, linear, elongated, straight, long-pointed, at length slightly pubescent or glabrous.—*Pers. syn.* 2. *p.* 329; *DC. prod.* 2. *p.* 252; *Spr. syst.* 3. *p.* 234; *Wight! cat. n.* 896.—T. Mitchelii, *Graham! in Wall.! L. n.* 5641,—Cracca, *n.* 300, *Linn.! in herb. Herm.!; fl. Zeyl. p.* 140.—Galega maxima, *Linn. sp. p.* 1063.——Arid soils.

We cannot find this in Roxburgh's fl. Indica, although not unfrequent near Samulcottah, where Roxburgh resided: perhaps he may have confounded it with *T. purpurea*, to which it is so very closely allied that future discoveries may bring to light intermediate forms.

665. (14) T. *spinosa* (Pers.:) shrubby; branches numerous, woody, rigid, spreading in every direction, clothed with white soft adpressed somewhat cottony hairs: leaves pinnated; leaflets 2–4 pair, cuneate, emarginate; upper side glabrous, under clothed with adpressed white silky hairs: stipules subulate, patent, rigid, spinous (in the wild plant); flowers axillary, 1–2 together, short peduncled: calyx hairy; segments subulate, about the length of the tube: vexillum hairy: legumes spreading, much compressed, linear, falcate, more or less clothed with somewhat adpressed hairs, 6–8-seeded.—*Pers. syn.* 2. *p.* 330; *DC. prod.* 2. *p.* 254; *Spr. syst.* 3. *p.* 233; *Wall.! L. n.* 5651; *Wight! cat. n.* 900.—T. pentaphylla, *Graham! in Wall.! L. n.* 5650.—Galega spinosa, *Linn.! suppl. p.* 335; *Roxb. fl. Ind.* 3. *p.* 383; *in E. I. C. mus. tab.* 409.—G. pentaphylla, *Roxb.! fl. Ind.* 3. *p.* 384; *in E. I. C. mus. tab.* 1628.——Arid soils.

Galega pentaphylla of Roxburgh is merely the cultivated state of this species: the whole plant, and particularly the stipules, are less rigid, and the leaves much larger than in the wild specimens, which is to be imputed to the damper and richer soil of the Calcutta Botanic Garden.

†660. (15) T. *subsessilis* (Graham,)—*Grah. in Wall. L. n.* 5969.

XXI. SESBANIA. *Pers.*

Calyx 5-cleft or 5-toothed, lobes nearly equal. Corolla papilionaceous: vexillum larger than the keel, roundish, with an adnate callous slightly folded appendage on its claw: keel obtuse, the petals distinct at the base. Stamens diadelphous (9 and 1), the sheath slightly auricled at the base. Legume linear, elongated, slender, cylindrical or compressed, torulose, many-seeded, much contracted between the seeds, but not truly jointed.—Shrubs or herbaceous plants. Cauline stipules lanceolate. Leaves abruptly pinnated; leaflets many pairs: petioles ending in a bristle point. Peduncles axillary. Flowers racemose, usually yellow.

667. (1) S. *Ægyptiaca* (Pers.:) arborescent, unarmed, glabrous: leaves about three times longer than broad; leaflets 10–18 pairs, oblong-linear, obtuse, slightly mucronate: racemes axillary, lax, pendulous, about the length of the leaves, 3–12-flowered: legumes nearly terete, twisting when ripe.—*Pers. syn.* 2. *p.* 316; *DC. prod.* 3. *p.* 264; *Spr. syst.* 3. *p.* 272; *Wall.! L. n.* 5656.—Æschynomene Sesban, *Linn. sp. p.* 1061; *Roxb. fl. Ind.* 3. *p.* 332.—Æ. Indica, *Burm. Ind. p.* 169.—Coronilla Sesban, *Willd. sp.* 3. *p.* 1147.—*Pluk. t.* 164. *f.* 5; *and t.* 165. *f.* 2.—*α*; *bicolor*; leaflets usually 15–18 pair; vexillum purple on the outside.—*Wight! cat. n.* 906.—Æschynomene Suyminta, *Roxb. in E. I. C. mus. tab.* 295.—*Rheed. Mal.* 6. *t.* 27 (bad).—*β*; *concolor*; leaflets 10–12 pairs: vexillum yellow, speckled with black dots and lines.—*Wight! cat. n.* 905.—Sesban, *Roxb. in E. I. C. mus. tab.* 973.—*Burm. Zeyl. t.* 41.

668. (2) S. *aculeata* (Pers.:) herbaceous, annual, erect, sparingly branched,

Digitized by Google

glabrous: stem and petioles usually sprinkled with minute cartilaginous points: leaves 8–10 times longer than broad; leaflets 20–40 pairs, linear, obtuse, mucronate: racemes axillary, peduncled, erect, lax, often about half the length of the leaves; few-flowered: flowers pretty large (more than half an inch long), on slender pedicels: corolla about 4 times the length of the calyx: legumes erect, nearly terete, sharp-pointed.—*Pers. syn.* 2. *p.* 316 (excl. syn.); *DC. prod.* 2. *p.* 265 (excl. syn.); *Spr. syst.* 3. *p.* 272; *Wall. L. n.* 5655; *Wight! cat. n.* 904.—Æschynomene spinulosa, *Roxb. fl. Ind.* 3. *p.* 333; *in. E. I. C. mus. tab.* 296.—*Æ.* cannabina, *Roxb. fl. Ind.* 3. *p.* 335.—*Æ.* bispinosa, *Jacq. ic. rar.* 3. *t.* 564.—Coronilla aculeata, *Willd. sp.* 3. *p.* 1147.

S. affinis, Schrad., was probably raised from seeds of Roxburgh's *Æsch. cannabina*, and ought therefore to be referred here, but De Candolle describes the legumes pendulous.

669. (3) S. *cannabina* (Pers.:) herbaceous, annual, erect, sparingly branched, glabrous: young parts sprinkled with minute cartilaginous points: leaves 8–10 times longer than broad; leaflets linear, obtuse, mucronate: racemes axillary, nearly sessile, very short, 1–4-flowered: flowers small (scarcely a quarter of an inch long), on short pedicels: corolla twice the length of the calyx: legumes erect, "compressed-tetragonal," (*Willd.*)—*Pers. syn.* 2. *p.* 316; *DC. prod.* 2. *p.* 265; *Spr. syst.* 3. *p.* 272; *Wall.! L. n.* 5657; *Wight! cat. n.* 903.—Æschynomene cannabina, *Retz. obs.* 5. *p.* 26.—Coronilla cannabina, *Willd. sp.* 3. *p.* 1148.

S. cochinchensis, DC., or *Coronilla cochinchensis*, Lour., appears to be this species, which we have from China; nor is there almost any thing of consequence in Loureiro's description at variance.

† 670. (4) S. *procumbens* (W. & A.:) "annual, diffuse, somewhat armed with inoffensive prickles: leaflets minute, about 20 pairs: peduncles axillary, short, 2–3-flowered: legumes linear, erect, cuspidate." *Roxb.*—Æschynomene procumbens, *Roxb. fl. Ind.* 3. *p.* 337.—*Æ.* diffusa, *Roxb. in E. I. C. mus. tab.* 297.——Coromandel, on wet pasture land, borders of rice fields, &c.

Roxburgh compares this with his *Æ. uliginosa* (in E. I. C. mus. tab. 974), which, although also a species of *Sesbania*, is by no means the same as *S. uliginosa* of authors. So far as we can judge from descriptions, the two plants of Roxburgh form but one species; nor is there any other difference pointed out except that *Æ. uliginosa* (from Calcutta) has "twice the number of leaflets to the leaf, and more than twice the number of flowers to the raceme."

XXII. AGATI. *Adans.; Desv.; DC.*

Calyx campanulate, slightly 2-lipped; upper lip with 2, under with 3 short obtuse broad teeth. Corolla papilionaceous. Vexillum oval, oblong, shorter than the oblong alæ: keel large, falcate, obtusely acuminated, its petals free at the base and apex. Stamens diadelphous (9 and 1), slightly protruded: sheath with large auricles at the base. Style filiform. Legume attenuated at the base into a stalk, linear, elongated, a little compressed, many-seeded, much contracted between the seeds, but not jointed. Seeds separated by cellular partitions.—Small trees of rapid growth and short duration. Stipules lanceolate. Leaves abruptly pinnated; leaflets many pair. Racemes axillary, 2–4-flowered. Flowers very large. Legumes pendulous, upwards of a foot long.

671. (1) A. *grandiflora* (Desv.)—*Wall.! L. n.* 5654.—Æschynomene grandiflora, *Roxb. fl. Ind.* 3. *p.* 331.—*α*; *albiflora*; flowers white.—*Wight! cat. n.* 901.—A. grandiflora, *Desv. in journ. Bot.* 3. *p.* 120; *DC. prod.* 2. *p.* 266.—Æschynomene grandiflora, *Linn. sp. p.* 1050; *Roxb. in E. I. C. mus. tab.*

Digitized by Google

294.—Coronilla grandiflora, *Willd. sp. p.* 3. *p.* 1145.—Sesbania grandiflora, *Pers. syn.* 2. *p.* 316; *Spr. syst.* 3. *p.* 272.—*Rheed. Mal.* 1. *t.* 51; *Rumph. amb.* 1. *t.* 76.—β; *coccinea*; flowers red.—*Wight! cat. n.* 902.—A. coccinea, *Desv. in journ. Bot.* 3. *p.* 120; *DC. prod.* 2. *p.* 266.—Æschynomene coccinea, *Linn. suppl. p.* 330.—Æ. grandiflora, *Roxb. in E. I. C. mus. tab.* 294. bis.—Coronilla coccinea, *Willd. sp.* 3. *p.* 1146.—Sesbania coccinea, *Pers. syn.* 2. *p.* 316; *Spr. syst.* 3. *p.* 272.—*Rumph. amb.* 1. *t.* 77.

We have never been able to persuade ourselves of the validity of the two supposed species. Willdenow, trusting to the figures in Rumphius, has stated the legumes of the first to be straight, of the other curved: some botanists assert those of the white one to be compressed, and of the red terete, but Linnæus describes them in *A. coccinea* to be likewise compressed. Desvaux mentions that the leaves of the one kind are puberulous, of the other glabrous: we find no difference in that respect; and, in short, the only certain character between the two that we can give is the colour of the flowers.

SUBTRIBE III.—HEDYSAREÆ. *DC.*

Corolla papilionaceous. Stamina rarely distinct, usually either monadelphous or diadelphous (9 and 1, or 5 and 5), often somewhat persistent. Legume transversely divided into several 1-seeded cells or joints, rarely 1-celled, and then always 1-seeded. Cotyledons flattish, during germination somewhat foliaceous.—The several-seeded genera are usually readily distinguished by the above character; but those with 1 seed must be examined with more caution; such have however always, we believe, the stamen-tube somewhat persistent.

A. *Flowers usually racemose: legume compressed.*—Euhedysareæ. *DC.*

XXIII. ORMOCARPUM. *Beauv.*

Calyx furnished with two persistent bracteoles at its base, 5-cleft, and more or less evidently bilabiate; all the segments acute. Corolla papilionaceous: vexillum broad, entire: keel obtuse, the petals slightly cohering at the back. Stamens diadelphous (9 and 1, or 5 and 5). Legume stalked, composed of several joints: joints oblong, attenuated at both ends, a little compressed, marked longitudinally with striæ and warts, separating readily from each other, 1-seeded.—Shrubs. Leaves simple, or unequally pinnated: leaflets not furnished with a prickly point, glabrous. Racemes short, few-flowered, axillary.

O. sulcatum, Beauv., is, according to Desvaux, the same with *Pictetia ternata*, DC., but to which genus it belongs we have not materials to decide. The caducous bracteoles and want of warts to the fruit indicates a *Pictetia*; while, on the other hand, if the fruit be sulcated longitudinally, as Beauvois says, it can scarcely be removed from *Ormocarpum*. We have extended the character of the genus to comprehend the Indian one, the structure of the pod being very different from that of *Æschenomene*, with which the stamens would otherwise ally it. Perhaps it ought to form a genus bearing the same relation to *Æschynomene* that *O. verrucosum* does to *Desmodium*.

672. (1) O. *sennoides* (DC.:) young shoots, petioles, peduncles, and calyx, covered with soft glutinous hairs: leaves unequally pinnated; leaflets alternate, 4–6 pair, obovate, retuse, slightly mucronulate: calyx evidently bilabiate: stamens equally diadelphous (5 and 5): legume 2–5-jointed; joints striated, armed with minute prickly warts.—*DC. prod.* 2. *p.* 315; *Wall.! L. n.* 5658; *Wight! cat. n.* 797.—Hedysarum sennoides, *Willd. sp.* 3. *p.* 1207; *Spr. syst.* 3. *p.* 314; *Roxb. fl. Ind.* 3. *p.* 364.—H. Nalla-Kashina, *Roxb. in E. I. C. mus. tab.* 493.——Circars. Vendalore.

De Candolle unites to this with doubt the *O. cassioides*, Desv., but Desvaux asserts that they bear no relation to each other.

Digitized by Google

XXIV. ZORNIA. *Gmel.*

Calyx membranaceous, campanulate, divided in the middle into 2 lips; upper lip obtuse, emarginate; lower 3-cleft. Corolla papilionaceous, inserted into the bottom of the calyx. Vexillum orbicular, its sides revolute: keel-petals lunulate, cohering at the back. Stamens monadelphous, alternately shorter: anthers alternately oblong and globose. Legume compressed, 2–5-jointed, exceedingly contracted between the joints: joints roundish, usually hispid.—Usually herbaceous plants. Stipules sagittate; lower ones lanceolate; upper ones larger, and supplying the place of bracteas. Leaves petioled: leaflets 2 or 4, all springing from the apex of the petiole. Flowers yellow, sessile, each bracteated with two opposite stipules.

673. (1) Z. *angustifolia* (Sm.:) annual, diffuse: leaflets 2, oblong or lanceolate, mucronate, glabrous, conspicuously dotted: bracteas sagittate-ovate, acute, ciliated, pellucid-dotted; legumes sometimes scarcely so long as the bracteas, sometimes longer than them, pubescent, sprinkled irregularly with reverse-scabrous prickles.—*Smith! in Rees' cycl.; DC. prod.* 2. *p.* 316; *Spr. syst.* 3. *p.* 311; *Wall.! L. n.* 5660. *a–e.*—Hedysarum diphyllum *α*, *Linn.; Roxb. fl. Ind.* 3. *p.* 353.—*α*; *lancifolia;* leaflets lanceolate, acuminated.—*Wight! cat. n.* 812.—*β*; *oblongifolia;* leaflets narrow-oblong, somewhat obtuse, with a mucro.—*Wight! cat. n.* 810.—*Rheed. Mal.* 9. *t.* 82 (not good).

We have only referred to some of the letters in Wallich's List; of the specimens not found in the Peninsula we feel less certain: one of them, *g*, from Nepal, has the long leaves of our *α*; but they are ciliated, and the legumes are glabrous as in our next species; while from both it may be distinguished by the legumes being beautifully marked with elevated reticulations: we propose to name it *Z. reticulata;* probably some of the Bengal plants may prove the same.

674. (2) Z. *Zeylonensis* (Pers.:) annual, diffuse: leaflets 2, oblong or ovate, mucronate, glabrous, with adpressed hairs on the margin and midrib beneath, slightly dotted: bracteas sagittate-ovate, acute, opaque-dotted: legumes 2–3 times the length of the bracteas, glabrous or ciliated on the sutures, sprinkled irregularly with longish smooth glochidiate prickles—*α*; *Plukenetii;* leaflets oblong, about 3 times longer than broad, acute, much shorter than the common petiole.—*Wight! cat. n.* 811.—Z. conjugata. *Smith! in Rees' cycl.—Pluk. t.* 246. *f.* 6 (good).—*β*; *Burmanni;* leaflets oblique at the base, roundish-ovate, nearly as broad as long, about the length of the petiole.—*Wight! cat. n.* 813.—Z. Zeylonensis, *Pers. syn.* 2. *p.* 318; *DC. prod.* 2. *p.* 317; *Wall.! L. n.* 5661,—Z. Zeylanica, *Spr. syst.* 3. *p.* 311.—Hedysarum conjugatum, *Willd. sp.* 3. *p.* 1178,—*Burm. Zeyl. t.* 50. *f.* 1; *Pluk. t.* 102. *f.* 1; *Rheed. mal.* 9. *t.* 83 (bad).

XXV. GEISSASPIS. *W. & A.*

Calyx membranaceous, cleft almost to the very base into 2 lips: lips nearly equal, oblong-lanceolate; upper one quite entire; lower with a very minute inconspicuous sharp tooth on each side near the apex. Corolla papilionaceous, inserted into the bottom of the calyx: vexillum large, at first covering the other petals, afterwards reflexed: alæ narrow-oblong, obtuse, erect, as long as the keel: keel incurved, its petals semi-oval, obtuse, united only for a very small space at their back. Stamens of equal length, monadelphous: anthers all roundish. Ovary 2-ovuled. Style compressed. Stigma simple. Legume 2-jointed (often by abortion reduced to one joint), glabrous, reticulately veined, tumid in the middle, thin at both margins.—Pro-

Digitized by Google

cumbent herbaceous or suffrutescent plants, glabrous except on the margins of the stipules and bracteas. Leaves equally pinnated: leaflets 2 pair (the pairs approximated but not from the same point), cuneate-obovate, retuse, unequally 2–4-nerved at the base, dotted. Stipules semi-sagittate, lanceolate, larger on the young shoots, ciliated. Racemes axillary or terminal, on longish peduncles. Bracteas large, orbicular, obliquely cordate or somewhat semi-sagittate at the base, alternate, many-nerved, reticulated with veins, inconspicuously dotted, glabrous, the margin ciliated with long brownish patent bristles. Flowers solitary in each bractea, pedicelled, purplish when dry.

This genus is no doubt closely allied to *Zornia*, but differs by its habit, as well as by several characters. The flowers appear purplish, but Klein mentions that the vexillum is orange-coloured.

675. (1) G. *cristata* (W. & A.)—*Wight! cat. n.* 823.—Zornia disperma, *Graham! in Wall.! L. n.* 5663.—Hedysarum bijugum, *herb. Klein!*—Smithia? cristata, *herb. Wight!*——Courtallum, in very moist soil. Malabar, in rice fields.

We have changed the specific name given by Dr Graham, as the legumes are by no means constantly 2-seeded; and besides that was not the one attached to the specimens sent by Dr Wight to Dr Wallich: that of Klein is the older, but scarcely sufficiently expressive.

XXVI. STYLOSANTHES. *Swartz.*

Calyx-tube very long, slender: limb 5-partite: lobes unequal. Corolla (in part) inserted on the throat of the tube of the calyx: keel minute, bifid at the apex. Stamens monadelphous: anthers alternately linear and ovate. Ovary sessile. Style filiform, very long, straight. Stigma capitate, hispid. Legume composed of one or two 1-seeded joints; the upper one acuminated and somewhat hooked with the base of the style.—Small herbaceous or suffrutescent plants. Stems branched. Leaves trifoliolate, the middle leaflets almost sessile. Stipules adnate to the petiole. Spikes terminal, dense, imbricated with stipules and bracteas. Flowers small, yellow.

676. (1) S. *mucronata* (Willd.:) suffruticose, branched, spreading: branches hirsutely pubescent: leaflets oblong-ovate, stiffly mucronate, slightly ciliated with short stiff bristles; under side of the younger ones a little pubescent and hairy: flowers axillary sessile and solitary, or forming small few-flowered terminal imbricated ovate spikes: bracteas ciliated: calyx-tube villous.—*Willd. sp.* 3. *p.* 1166; *DC. prod.* 2. *p.* 318; *Spr. syst.* 3. *p.* 310; *Wall.! L. n.* 5664; *Wight! cat. n.* 814.—Arachis fruticosa, *Retz. obs.* 4. *p.* 26; *Roxb. fl. Ind.* 3. *p.* 282; *in E. I. C. mus. tab.* 1273.—Hedysarum hamatum, *Burm. Ind. p.* 167; *Burm. Zeyl. t.* 106. *f.* 2; *Pluk. t.* 69. *f.* 1.

XXVII. ÆSCHYNOMENE. *Linn.; Lam. ill. t.* 629.

Calyx with two ovate deciduous bracteoles at its base, 2-lipped: upper lip bifid or 2-toothed, lower trifid or 3-toothed. Corolla papilionaceous, inserted into the bottom of the calyx: vexillum roundish: alæ oblong: keel cymbiform, bipartite at the base. Stamens equally diadelphous (5 and 5). Legumen compressed, straight, exserted, composed of many joints: joints square at both ends, easily separating from each other. Seeds solitary in each joint, compressed.—Herbaceous or shrubby plants. Leaves unequally pinnated; leaflets numerous. Stipules semisagittate. Racemes axillary. Flowers often yellow.

Digitized by Google

677. (1) *Æ. Suratteusis* (W. & A.:) suffruticose, diffuse, branched; branches angled, striated, and with the petioles peduncles calyx and keel of the corolla armed with hard sharp tubercles: leaflets 8–12-pairs, linear-oblong, obtuse at both ends, glabrous: racemes axillary, few-flowered: calyx large; lips entire: ovary densely clothed with adpressed white hairs: style considerably longer than the stamens, incurved at the apex: legumes long-stalked, about 6-jointed, very rough all over: middle of each joint elevated and surrounded by a furrow separating it from the thickened margin.—*Æ. aspera? Herb. Linn.*——Suratt.

We have only seen this species in the Linnean herbarium, in which Linnæus seems to have considered it as the same as his *Æ. aspera* from the Upsal garden. It appears, however, to be a distinct species.

678. (2) *Æ. aspera* (Linn.:) perennial, herbaceous, erect, floating, spongy, sometimes slightly branched and diffuse, usually glabrous: leaflets 30–40 pairs, linear, obtuse: racemes axillary, few-flowered, the peduncles and pedicels hispid with short horizontal bristly hairs: corolla much longer than the calyx, both a little hairy: legumes long-stalked, 4–7-jointed, covered when mature with prickly tubercles on the middle of each joint; margins thickened, striated and crenulated.—*Linn.! sp. p.* 1060; *DC. prod.* 2. *p.* 320; *Spr. syst.* 3. *p* 322; *Wight! cat. n.* 819.—*Æ.* Indica, *Wall.! L. n.* 5667.—*Æ.* aquatica, *Roxb. in E. I. C. mus. tab.* 298.—*Æ.* lagenaria, *Lour. coch.* 2. *p.* 544; *Spr. l. c.*—Hedysarum lagenarium, *Roxb.! fl. Ind.* 3. *p.* 365.

679. (3) *Æ. Indica* (Linn.:) annual, diffused, branched: branches slender, glabrous: young shoots, petioles, and peduncles, often slightly muricated: leaflets 15–20 pairs, linear, obtuse at both ends: peduncles axillary, slender, few-flowered, often with a small leaf at the base of the pedicels: calyx and corolla glabrous: legumes long-stalked, 6–10-jointed; joints at first smooth, afterwards with a few glandular dots, when mature rough with irregular confluent warts, tumid in the middle, thinner at the edge.—*α*; branches thicker, more spongy, ascending, arising from the root and along the main branch.—*Wight! cat. n.* 821.—*Æ.* Indica, *Linn. sp. p.* 1061; *DC. prod.* 2. *p.* 320; *Roxb. in E. I. C. mus. tab.* 299.—*Æ.* aspera, *Wall.! L. n.* 5666, *c, d, f.*—Hedysarum Nali-Tali, *Roxb. fl. Ind.* 3. *p.* 365.—*Rheed. Mal.* 9. *t.* 18; *Pluk. t.* 309. *f.* 3.—*β*; branches thinner, more twiggy, prostrate, arising nearly all from the root.—*Wight! cat. n.* 820.—*Æ.* pumila, *Linn. sp. p.* 1061; *DC. prod.* 2. *p.* 321; *Spr. syst.* 3. *p.* 322.—*Æ.* diffusa, *Herb. Madr.!*; *Willd. sp.* 3. *p.* 1164; *DC. l. c.*; *Spr. l. c.*; *Wall.! L. n.* 5665.—*Pluk. t.* 432, *f.* 7.—*α* in wet fertile fields. *β* in poor dryish soils.

Rheed. Mal. 9. t. 21, usually referred to the Linnean *Æ. pumila*, appears to us to be a species of *Cassia*. The above varieties are far from constant; indeed their only difference seems to arise from the soil in which they are found. Perhaps *Æ. Roxburghii*, Spr. syst. 3. p. 322 (to which we refer *Æ. aspera*, Wall. L. n. 5666, *a. b, c*—*Æ. viscidula*, Willd. en. p. 776—*Æ. subviscosa*, DC. prod. 2. p. 321—*Smithia aspera*, Roxb. fl. Ind. 3. p. 343—and Rumph. Amb. 4. t. 24) ought also to be reduced to the present species; but the stems are said to be quite erect, and branched only towards the top: we can point out, however, no other distinction. The legume in almost none of the species of the genus exhibits the warts or tubercles on its joints, until it advance towards maturity, so that no characters ought to be taken from that part until after an examination of numerous specimens in different stages of growth.

* † 680. (4) *Æ. pilosa* (Poir.:) stem herbaceous, hairy, compressed-tetragonal: leaflets short, oval, emarginate, mucronate, glabrous, marked with blackish veins: stipules broad at the base, acute, membranaceous-margined: racemes axillary, hairy, many-flowered: corolla very small: legumes smooth-

Digitized by Google

ish; joints tumid and scabrous in the middle.—*Poir. in Lam. enc. meth.* 4. *p.* 450; *DC. prod.* 2. *p.* 322; *Spr. syst.* 3. *p.* 322.

* † 681. (5) Æ.? *pubescens* (Poir.:) stem herbaceous, glabrous: branches patulous: leaflets oval, obtuse or retuse, mucronate, pubescent when young: stipules and bracteas oval, acute: racemes lax, terminal, glabrous, many-flowered: calyx large, membranaceous, almost angular, divided into 5 acute and unequal teeth: legume a little scabrous, pointed; the joints often unequal, lobed or toothed on one side, truncated on the other.—*Poir. in Lam. enc. meth.* 4. *p.* 450; *DC. prod.* 2. *p.* 322; *Spr. syst.* 3. *p.* 322.

Poiret adds that the leaflets are several times larger than in *Æ. pilosa*.

* † 682. (6) Æ.? *hirta* (Lam.:) clothed all over (except the corolla) with rigid hairs: stem herbaceous; branches terete: leaflets 7–9 pairs, oval-linear, mucronate: stipules resembling the leaflets but twice as long: raceme terminal, many-flowered: calyx 5-partite; segments subulate, nearly of equal length: corolla glabrous, a little longer than the calyx: legume hirsute; joints tumid and tubercled in the middle.—*Lam. ill. t.* 629, *f.* 1; *Poir. in Lam. enc. meth.* 4. *p.* 450; *DC. prod.* 2. *p.* 323; *Spr. syst.* 3. *p.* 322.

These three last are very obscure; nor have we seen any plants from East India (whence they are said to have been brought by Sonnerat) that bear any resemblance to the above characters. *Æ. hirta* is perhaps a species of *Uraria*.

XXVIII. SMITHIA. *Ait.; Lam. ill. t.* 627.

Calyx scariose, with two bracteoles at its base, bipartite: segments entire or slightly cleft. Corolla papilionaceous, inserted into the bottom of the calyx: keel cleft from the base to near the apex. Stamens 10, equally monadelphous (5 and 5). Legume 4–6-jointed, folded up within the calyx, very much contracted between the joints: joints 1-seeded, orbicular: sinus rounded.—Procumbent herbaceous plants with abruptly pinnated leaves. Leaflets few, ciliated with adpressed bristles. Stipules semisagittate. Racemes axillary, few-flowered. Corolla yellow.

S. spicata, Spreng. syst. 3. p. 323, and DC. prod. 2. p. 323, was collected by Perrin in Guadelupe (not Senegambia as stated by these authors), and sent by our friend Dr Torrey to Sprengel: it is, according to Dr Torrey, "compounded of the flowers of a species of *Cassia*, and fruit of *Mimosa pudica* or *sensitiva*, both cultivated specimens." *S. Martinicensis*, Spr. l. c., must likewise be removed from the genus.

683. (1) S. *sensitiva* (Ait.:) leaflets 3–6 pairs, oval, obtuse at both ends, glabrous except a row of bristles along the margin and midrib beneath: flowers forming a sessile or peduncled short raceme; peduncles glabrous; pedicels slightly hairy: calyx glabrous or sprinkled with a few bristles; segments striated, oblong-lanceolate, pointed; upper one entire, lower occasionally 3-toothed at the apex: vexillum orbicular, much longer than the calyx: legume 4–6-jointed, warted.—*α*; racemes few-flowered, peduncled.—S. sensitiva, *Ait. hort. Kew.* 3. *p.* 496. *t.* 13; *Roth, nov. sp. p.* 351; *DC. prod.* 2. *p.* 323; *Spr. syst.* 3. *p.* 323; *Roxb. ! fl. Ind.* 3. *p.* 342; *Wall.! L. n.* 5668, *a, b, e, f, g.*—Hedysarum ciliatum, *Roxb. in E. I. C. mus. tab.* 1083.—*β*; racemes about 2-flowered, sessile.—*Wight ! cat. n.* 822.—S. sensitiva, *Wall. ! L. n.* 5668, *c, d, i.*—S. geminiflora, *Roth, nov. sp. p.* 352; *DC. l. c.; Spr. l. c.* —*Rheed. mal.* 9. *t.* 38.——*β* Courtallum. Travancore. Malabar.

S. conferta, Smith! scarcely differs from our var. *β* of this species: the lips of the calyx being sometimes toothed in the Indian as well as in the New Holland plant: may there not be a mistake as to the locality?—*S. pumila*, Royle! mst. (from Bengal) is closely allied to our var. *α*: it differs, however, by the leaflets broader upwards; by the calyx reticulately veined, toothed and ciliated with bristles; by its upper lip broader upwards and then almost

Digitized by Google

truncated and slightly split at the apex, and the lower ovate; and by the vexillum oblong and scarcely longer than the calyx. In both the peduncles are glabrous, or with one or two scattered bristles, and the leaflets have bristles along the midrib beneath.

684. (2) S. *racemosa* (Heyne:) leaflets cuneate-oblong, retuse, bristly on the margin and slightly so on the midrib beneath: flowers forming a pedunculed short raceme: peduncles longer than the leaves, and with the pedicels and calyx glandular and hairy: upper lip of the calyx broad, truncated, slightly emarginate; lower shortly 3-cleft: legume about 4-jointed, slightly warted.—*Heyne! in Wall.! L. n.* 5670.

S. blanda, Wall.! L. n. 5669, has also glandular and hairy racemes, the upper lip of the calyx broad, truncated and emarginate, and the lower 3-lobed: but the cuneate-oblong leaflets do not appear to have any bristles on the midrib; the racemes are, comparatively speaking, elongated, the flowers much larger, the calyx more hairy, and the joints of the legume with one or two elevated reticulating veins, but without any tubercles or warts.

XXIX. LOUREA. *Neck.*

Calyx campanulate, reticulately veined, persistent, equally 5-cleft, scariose and inflated when in fruit. Corolla papilionaceous: vexillum obcordate; keel obtuse. Stamens diadelphous (9 and 1). Legume composed of 4–6 joints, folded up within the calyx, exceedingly contracted between the joints: joints 1-seeded, between orbicular and semiorbicular.—Herbaceous, erect. Stipules setaceous. Leaves trifoliolate, or simple from the abortion of the lateral ones. Racemes terminal.

* 685. (1) L. *Vespertilionis* (Desv.:) lateral leaflets none, or small, obliquely cuneate at the base and truncated at the apex; terminal one transverse, about 10 times broader than long, tipped with a spiny bristle, 2-lobed; lobes divaricating, oblong-lanceolate, falcately recurved obtuse.—*Desv. Journ. Bot.* 3. *p.* 122; *DC. prod.* 2. *p.* 323; *Wall.! L. n.* 5671; *Wight! cat. n.* 801.—Hedysarum Vespertilionis, *Linn. suppl. p.* 331; *Spr. syst.* 3. *p.* 315; *Roxb. ! fl. Ind.* 3. *p.* 352.—H. volitans, *Roxb. ! in E. I. C. mus. tab.* 1165.

XXX. URARIA, *Desv.*—Doodia, *Roxb.*

Calyx hairy, not becoming inflated when in fruit, deeply 2-lipped; upper lip bifid, lower 3-partite. Corolla papilionaceous. Stamens diadelphous (9 and 1): filaments somewhat persistent. Style thickened towards the apex. Legume 2–6-jointed; joints slenderly connected, and folded up, sometimes in maturity slightly unfolding.—Perennial, often shrubby plants: young parts hairy. Leaves simple, or trifoliolate, or pinnated: leaflets with two partial stipules. Stipules lanceolate, acuminated, scariose, striated; upper ones very caducous, covering the flowers in place of bracteas. Racemes terminal, simple, many-flowered: pedicels in pairs from each bractea.

The generic character given by De Candolle is by no means applicable to all the species brought by him under it.

688. (1) U. *picta* (Desv.:) shrubby, erect, young parts clothed with hooked hairs: leaves simple and pinnated; simple ones oblong-ovate; leaflets of the compound ones 2–4-pair, linear-lanceolate, obtuse, upper side clouded, under a little reticulated and pubescent: racemes terminal, very long, spike-like, rigid: bracteas below the raceme persistent, ovate-lanceolate, acuminated, rigid: pedicels covered with short hooked hairs, much incurved at the apex after flowering: calyx-segments bearded with long hairs, lanceolate-setace-

Digitized by Google

ous, the lower ones at length about twice as long as the upper: legume 3–6-jointed.—*Desv. Journ. Bot.* 3. *p.* 122; *DC. prod.* 2. *p.* 324; *Wall.! L. n.* 5674. —Doodia picta, *Roxb. fl. Ind.* 3. *p.* 368.—Hedysarum pictum, *Jacq. ic. rar.* 3. *t.* 567; *coll.* 2. *p.* 262; *Spr. syst.* 3. *p.* 316.—H. crinitum, *Roxb. in E. I. C. mus. tab.* 402.——Circars, by the shady banks of water-courses; *Roxburgh.*

From this *U. crinita*, Desv. (with which *U. comosa*, DC. is identical), may be recognised by the pedicels covered with long spreading stiff hairs, and by the bracteas at the base of the pedicels being beautifully ciliated with white hairs, as well as by the leaflets being much broader, more acute, and not clouded.

689. (2) U. *lagopoides* (DC.:) suffruticose, procumbent, rooting at the joints: stems terete, pubescent: leaves simple and ternate; the terminal leaflet much the larger, roundish-ovate, sometimes emarginate at the base, obtuse, mucronate, sprinkled with a short scabrous pubescence: racemes terminal, conical-oblong, dense, very hairy: pedicels shortish, incurved at the apex, and with the calyx densely bearded: upper lip of the calyx short, the segments ovate-acuminated; lower reflexed, the segments elongated and subulate-setaceous: legume 2-jointed; joints orbicular-ovate, polished.—*DC. prod.* 2. *p.* 324; *Wight! cat. n.* 799.—U. retusa, *Wall.! L. n.* 5680.—Doodia lagopodioides, *Roxb.! fl. Ind.* 3. *p.* 366.—Hedysarum lagopoides, *Burm. Ind. p.* 68. *t.* 53. *f.* 2; *Linn.! sp. p.* 1057; *Roxb. in E. I. C. mus. tab.* 975.—H. alopecuroides, *Rottl.; Spr. syst.* 3. *p.* 312.—Lespedeza lagopoides, *Pers. syn.* 2. *p.* 308; *Spr. l. c. p.* 202.

U. lagopoides, Wall. L. n. 5676 (or *Doodia alopecuroides*, Roxb. and *Hed. alopecuroides*, Roxb. in E. I. C. mus. tab. 1615), is, we believe, quite a different species, although in character it approaches pretty close to the present. Linnæus, in the second edition of the Sp. Plantarum, describes the legumes as one-seeded, but this he corrected in the twelfth edition of the Systema Naturæ, 2. p. 495; although, however, the correction has been copied into the Systema Veget. p. 562, and into Willd. sp. pl. 3. p. 1204, botanists have to this day unnecessarily puzzled themselves by consulting only the original description. What is remarkable is, that if he erred at first by making the number of seeds too few, in his correction he makes them too many (3–4); we have never found more than two joints.

690. (3) U. *hamosa* (Wall.:) shrubby, diffuse; young parts clothed with short hooked hairs: leaves simple and trifoliolate; leaflets elliptic or roundish, sometimes emarginate, glabrous above, softly pubescent beneath: racemes axillary and terminal, hispidly hairy, before expansion of the flowers oblong or cone-like and imbricated with bracteas, in fruit becoming much elongated and lax; bracteas caducous, ovate with a long subulate point, hairy; pedicels shortly hairy, incurved at the apex: calyx shortly hairy, short, not longer than the first joint of the fruit; upper lip 2-toothed; segments of the lower one ovate-acuminated: legume 2–6-jointed, pubescent.—*Wall.! L. n.* 5681; *Wight! cat. n.* 800.—U. desmodioides, *Graham! in Wall.! L. n.* 5683.—Doodia hamosa, *Roxb. fl. Ind.* 3. *p.* 366.—Hedysarum hamosum, *Roxb. in E. I. C. mus. tab.* 1614.

We scarcely see how *U. lanceolata*, Graham! in Wall. L. n. 5682, and *U. leptostachya*, Wall! L. n. 5684, can be distinguished. *U. campanulata*, Wall.! L. n. 5685, is closely allied, but differs apparently by its calyx.

691. (4) U.? *styracifolia* (W. & A.:) shrubby; young parts, under side of the leaves and calyx clothed with adpressed longish soft white hairs: branches angled: leaves simple or trifoliolate; leaflets glabrous above, roundish-obovate, retuse; terminal one the largest: racemes axillary and terminal, shorter than the petiole, at first cone-like; pedicels becoming deflexed whilst flowering; bracteas caducous, ovate-acuminated, nearly glabrous on the back, villous on the margin: lips of the calyx short, nearly equal; upper 2-fid, seg-

Digitized by Google

ments triangular; lower deeply 3-cleft, segments lanceolate-acuminated: legume 2–4-jointed, much longer than the calyx.—*Wight! cat. n.* 986, 791, *b.* ?—Hedysarum styracifolium, *Linn.! sp. p.* 1052 (not of most authors).—H. retroflexum, *Linn.! mant. p.* 103; *Spr. syst.* 3. *p.* 317.—H. procumbens, *Roxb.* ? *fl. Ind.* 3. *p.* 645.—H. pilosum, *Roxb.* ? *in E. I. C. mus. tab.* 395.—Nicolsonia styracifolia, *Desv. in ann. sc. nat.* 9. *p.* 418.—Desmodium retroflexum, *DC. prod.* 2. *p.* 336.—D. orbiculatum, *Wall.! L. n.* 5695.—D. rotundifolium, *Wall.! L. n.* 5696.

Wight, cat. n. 791. *b*, probably from growing in a poor soil, has a quite different appearance from the usual forms: it is merely suffruticose, with prostrate, diffuse, slender branches; the branches are only pubescent, and the leaves, although pubescent, are not covered with long white hairs on the under side; the calyx is however white with hairs, and the raceme is the same as in the type of the species: this agrees so well with Roxburgh's figure of his *H. pilosum* (*H. procumbens* of the Flora Indica), that, although the pedicels are represented erect, we can hardly doubt of their identity.—The Linnean specimens are both indifferent: on the one the leaves are all simple, on the other all trifoliolate; but they agree in every other respect: and Dr Wallich's and our own specimens show both kinds of leaves on the same individual. The reflexed pedicels are very remarkable; they become so, soon after the enveloping bracteas have fallen off. With regard to the genus, we have had some difficulty: the legume is by no means straight as in *Desmodium*, nor yet is it folded up when mature, as is usual in *Uraria*: when about half ripe, it may, however, be observed considerably folded; and it is probably this circumstance that has already induced Dr Graham, in Wallich's List, to refer it doubtfully as we have done. It agrees also with *Uraria* in the rigid nature of its pedicels, and the hairy calyx; but it differs from all the other hitherto described species by the pedicels being deflexed, and not horizontal with the extremity incurved: but in the *U. retrofracta*, Wall. L. n. 5678 (if a specimen in Dr Wight's herbarium be correctly so named), the pedicels are rigid, between erect and spreading, with the extremity recurved: in that species, one of the most curious of the genus, the branches, petioles, and leaves, are glabrous; the leaves reverse-reniform, retuse at the base; the bracteas subulate, rigid, and with the pedicels sprinkled with spreading hairs; and the flowers are very minute.

XXXI. DESMODIUM. *Desv.; DC.*

Calyx with two usually caducous bracteoles at its base, cleft to the middle into two lips; upper lip 2-cleft; lower 3-partite. Corolla papilionaceous, inserted into the base of the calyx: vexillum roundish: keel obtuse, but not truncated. Stamens diadelphous (9 and 1), or monadelphous from the base to the middle and usually diadelphous upwards: filaments somewhat persistent. Ovary with several ovules. Style filiform. Stigma capitate. Legume compressed, composed of several joints: joints 1-seeded, separating at maturity.—Herbaceous or suffrutescent plants or small trees. Leaves either pinnately trifoliolate, or simple by the abortion of the lateral leaflets. Partial stipules 2 at the base of the terminal leaflet, solitary at the base of the lateral ones. Flowers usually racemose, sometimes umbelled, sometimes on simple peduncles, axillary or more usually terminal. Flowers purplish, blue, or white.

Sub-gen. I. DENDROLOBIUM (W. & A.) Calyx with two lanceolate subulate caducous bracteoles, campanulate, 4-cleft; upper segment split at the apex. Stamens monadelphous: filaments of equal length: anthers oblong, versatile. Joints of the legume coriaceous, indehiscent, somewhat elliptical,

Digitized by Google

truncated at both ends.—Small trees. Leaves pinnately trifoliolate. Peduncles axillary, solitary, much shorter than the petiole, bearing at the apex an umbel or short corymb: pedicels 1-flowered. Flowers white.

Probably this ought to form a distinct genus, and with that view we have not adopted the name of *Eudesmodium* given by De Candolle. We exclude *D. lutescens*, Desv. and DC., which does not differ from *Dicerma elegans*.

692. (1) D. *umbellatum* (DC.:) arborescent: young shoots pubescent or villous somewhat angled: leaves trifoliolate; leaflets oval, obtuse, glabrous above, whitish-pubescent beneath, the terminal one the largest: stipules caducous: peduncles axillary, much shorter than the petiole: flowers 10–12, somewhat umbellate: legumes 3–4-jointed, thick-margined, at first more or less villous, afterwards becoming more glabrous.—*DC. prod.* 2. *p.* 325; *Wall.! L. n.* 5687.—Hedysarum umbellatum, *Linn.! sp. p.* 1053; *Willd. sp.* 3. *p.* 1182; *Spr. syst.* 3. *p.* 816.—*Burm. Zeyl. t.* 51 (good).

It is possible that more than one species may be comprehended under the above character: thus Wall. L. n. 5687, *b, e, f,* has the legumes villous; *a* has them glabrous with the joints larger and more fleshy: in *d* they are slightly pubescent and villous along the sutures; but these agree in all other points. We have not seen *Hed. arboreum* of Roxburgh, but judging by his description (fl. Ind. 3. p. 361) it seems refcrable to the present species.

693. (2) D. *congestum* (Wall.:) arborescent: old branches glabrous; young shoots obtusely triangular, clothed with whitish pubescence: leaves trifoliolate; leaflets oblong-lanceolate, nearly glabrous, except the white-pubescent parallel nerves beneath: stipules lanceolate-acuminated: peduncles axillary, solitary, several times shorter than the petioles: flowers numerous, somewhat umbelled: calyx-segments broad, about equal: legumes compressed, slightly pubescent, 4–6-jointed.—*Wall.! L. n.* 5723 (partly); *Wight! cat. n.* 789.—Hedysarum umbellatum, *Roxb. fl. Ind.* 3. *p.* 360; *in E. I. C. mus. tab.* 399.
——Circars. Travancore.

It is almost impossible, in the absence of fruit, to distinguish this from the following; and we think it therefore probable that some of the specimens distributed by Dr Wallich under n. 5721 of his List, belong to *D. congestum*: this name, indeed, appears to have originated in a mistake for *confertum*, of which, although Dr Wallich refers it to n. 5721. *a* (partly), our specimens from Rottler's herbarium show to be what is here called *D. congestum*.

* 694. (3) D. *cephalotes* (Wall.:) arborescent: branches obtusely triangular, densely clothed when young with adpressed white silky pubescence, afterwards more glabrous: leaves trifoliolate; leaflets oblong or oblong-lanceolate, clothed with woolly or silky hairs when young, soon glabrous; nerves parallel, woolly beneath: stipules scariose, acuminated: peduncles axillary, several times shorter than the petioles, many-flowered: lower calyx-segments narrower and longer than the others: legumes densely villous, 2–3-jointed.—*Wall.! L. n.* 5721 (partly).—Hedysarum cephalotes, *Roxb. fl. Ind.* 3. *p.* 360; *in E. I. C. mus. tab.* 1620.

Sub-gen. 2. DESMODIUM. Stamens diadelphous, or monadelphous below the middle. Legume membranaceous; joints reticulately veined.—Herbaceous or suffrutescent plants. Flowers never umbellate. Pedicels filiform, 1-flowered.

§ 1. *Flowers 2–3 from each bractea, arranged in straight racemes: bracteas small.*

a. Leaves simple: petiole winged: joints of the legume broader than long, straight on the one suture, slightly curved on the other, truncated at both ends.

695. (4) D. *triquetrum* (DC.:) suffrutescent, erect, branched: branches

Digitized by Google

triangular, pubescent principally on the angles: leaves cordate, ovate or linear-oblong, acuminated, glabrous above, pubescent beneath: petioles winged; wings acuminated or mucronate on each side at the apex: racemes axillary and terminal, many-flowered: bracteas subulate: legumes hairy, 5–8-jointed, straight on the one suture, slightly crenated on the other; joints about a half broader than long.—*DC. prod.* 2. *p.* 326; *Wall.! L. n.* 5688, *d, e, f, g, l* (partly), *m* (from Prome), *n* (from Chappadong), *o* (partly), *p* (partly); *Wight! cat. n.* 790.—Hedysarum, n. 286, *Linn.! fl. Zeyl.*—H. triquetrum, *Linn. sp. p.* 1052; *Burm. fl. Ind. t.* 52. *f.* 2; *Spr. syst.* 3. *p.* 319.—H. alatum, *Roxb. fl. Ind.* 3. *p.* 348.—*Burm. Zeyl. t.* 81.

This is the only species with winged petioles hitherto found in the Peninsula; but perhaps *D. alatum*, DC. (*Hed. triquetrum*, Roxb., but not *H. alatum*, Roxb.), and *D. pseudotriquetrum*, DC., have been overlooked, if indeed they be distinct species: to the former of these belongs *D. triquetrum*, Wall.! L. n. 5688, *a, b, k* (partly), *m* (from Æst. Irawaddi), *n* (from Moolmyne); and to the latter Wall.! L. n. 5688, *c, i, k* (partly), *l* (partly), *p* (partly). We know, however, of no character to distinguish the three species but the different degrees of hairiness on the fruit, the ovary and legume being quite glabrous in *D. alatum*, and glabrous on the sides but hairy on the sutures in *D. pseudotriquetrum*.

b. Leaves simple: petiole simple: legume straightish on one side, deeply notched on the other; joints semicircular.

696. (5) D. *latifolium* (DC.:) shrubby, ascending, branched: branches terete, tomentose, spreading: leaves broadly cordate or ovate, obtuse or acuminated, repand-crenated, harshly pubescent on the upper side, tomentose on the under: petioles simple: stipules small, subulate from a broad semicordate base: racemes axillary and terminal; flowers very numerous: bracteas subulate-setaceous: legumes densely clothed with hooked hairs, 4–5-jointed, slightly crenated on the one suture, notched to the middle on the other: joints nearly semiorbicular, slightly truncated at both ends.—*Wall.! L. n.* 5692—*α, Roxburghii*; leaves cordate-ovate, almost as broad as long, obtuse or slightly acute; racemes lax before expansion as well as after, several times longer than the leaves.—*Wight! cat. n.* 792.—D. latifolium, *DC. prod.* 2. *p.* 327.—D. collinum, *Wall. L. n.* 5693.—Hedysarum latifolium, *Roxb. fl. Ind.* 3. *p.* 350; *in E. I. C. mus. tab.* 1611; *Roth, nov. sp. p.* 355.—*β, Telfairii*; leaves broadly ovate, retuse at the base, rounded at the apex, a little longer than broad: axillary racemes dense, about a half shorter than the leaf; terminal ones panicled.—*γ, Plukenetii*; leaves ovate-lanceolate, acuminated, about twice as long as broad; axillary racemes much shorter than the leaves, terminal ones panicled.—*Pluk. t.* 432. *f.* 3.

Of these our var. *α* alone is from the peninsula: *β* we know only as a Madagascar plant, cultivated in the Mauritius, and transmitted by Bojer and Telfair: *γ* we have from Prome. Perhaps these ought to form as many species.

697. (6) D. *Gangeticum* (DC.:) somewhat shrubby: stems irregularly angled, sprinkled with adpressed or spreading rigid white hairs: leaves simple, ovate, obtuse or acute, somewhat cordate at the base; upper side slightly scabrous or almost glabrous, under more or less pubescent or hairy: petioles simple: stipules subulate from a semi-cordate base: racemes axillary and terminal, very long, lax: bracteas setaceous: legumes 6–8-jointed, hispidly puberulous, straightish on the one suture, notched to near the back on the other: joints semiorbicular.—*DC. prod.* 2. *p.* 327; *Wall.! L. n.* 5689; *Wight! cat. n.* 793, 794.—D. maculatum, *DC. l. c.*; *Wall.! L. n.* 5690.—Hedysarum Gangeticum, *Linn.! sp. p.* 1052; *Roxb.! fl. Ind.* 3. *p.* 348; *in E. I. C. mus. tab.* 1610.—H. maculatum, *Linn.! sp. p.* 1051.—H. collinum, *Roxb. fl. Ind.* 3. *p.* 348.—H. styracifolium, *Roxb. in E. I. C. mus. tab.* 393.—*Pluk. t.* 50. *f.* 3.

Digitized by Google

After having examined the Linnæan specimens of *D. maculatum* and *D. Gangeticum*, we have no hesitation about uniting them: it is a common plant in India, and not unfrequently presents both supposed species on different branches of the same individual.

c. Leaves trifoliolate.

\+ *Legumes straightish on one suture, very deeply notched on the other: joints semicircular, not truncated.*

698. (7) D. *Wightii* (Graham:) herbaceous, diffuse: branches triangular, pubescent on the angles: leaves long-petioled, trifoliolate; leaflets oblong-lanceolate, acuminated, upper side glabrous, under slightly pubescent: stipules subulate: racemes terminal, elongated, many-flowered: bracteas minute, setaceous, about 3 together: pedicels in threes, slender, spreading: legumes glabrous, 6–8-jointed; joints semicircular, not truncated.—*Graham! in Wall.! L. n.* 5718; *Wight! cat. n.* 775.——Mountains of Cunnawady, near Dindygul.

Very closely allied to *D. sulcatum*, Graham! in Wall. L. n. 5736, which perhaps is only a more luxuriant state of the same plant.

\+ + *Legumes deeply notched on both sutures: joints orbicular.*

699. (8) D. *diffusum* (DC.:) herbaceous, procumbent, diffuse, branched: branches 4–5-angled, hispidly pubescent: leaves trifoliolate; leaflets oval, pubescent on both sides: stipules large, foliaceous, auricled and stem-clasping: racemes terminating every branch, very long: bracteas small, lanceolate, 2–3 together: flowers in pairs or threes: legumes ascending or nearly erect, 5–6-jointed, notched on both sutures, hispid with short hooked hairs; joints orbicular, tumid in the middle when mature: seeds oval, compressed, with the hilum at one of the narrow ends.—*DC. prod.* 2. *p.* 336; *Wight! cat. n.* 788.—D. dichotomum, *DC. l. c.*—D. Roxburghii, *Wall.! L. n.* 5716.—Hedysarum diffusum, *herb. Madr.!*; *Willd. sp.* 3. *p.* 1180; *Spr. syst.* 3. *p.* 312.—H. dichotomum, *Willd. l. c.*; *Spr. l. c. p.* 314.—H. quinqueangulatum, *Roxb. fl. Ind.* 3. *p.* 355; *in E. I. C. mus. tab.* 398.—H. auriculatum, *Roxb. fl. Ind.* 3. *p.* 355; *in E. I. C. mus. tab.* 1619.

We can perceive no difference between Roxburgh's two species, nor between these and the two described by Willdenow, and have therefore united them all. Sprengel's *Hed. Roxburghii*, judging from the character given, appears to be very distinct, but we cannot determine what it is, the legumes being unnoticed.

\+ + + *Legumes straight or nearly so on both sutures: joints 2–3 times as long as broad, truncated at both ends.*

700. (9) D. *recurvatum* (Graham:) shrubby: branches spreading, recurved, clothed as well as the raceme with short adpressed hairs, angled; young shoots triquetrous: leaves bifarious, trifoliolate; leaflets ovate or oval, glabrous above, pubescent beneath: stipules lanceolate, acuminated: racemes terminal, drooping before the flowers expand, afterwards very long (1–2-feet): bracteas lanceolate surrounding several smaller setaceous ones: flowers several together: legumes narrow-linear, straight on both sutures, clothed with short hooked hairs; joints more than twice as long as broad.—*Graham! in Wall.! L. n.* 5717.—Hedysarum recurvatum, *Roxb. fl. Ind.* 3. *p.* 358; *in E. I. C. mus. tab.* 1616.—H. latifolium? *herb. Madr.!*——Mountains of Travancore; Oct. 1814; *Klein.*

Judging from Sprengel's short description, we have no doubt but *H. Rottleri*, Spr. syst. 3. p. 320, or *H. lineare*, Rottl., is this species. *D. elongatum*, Wall. L. n. 5715, or *Hed. diffusum*, Roxb. (not Willd.), approaches also so closely that we had almost considered it a variety: it appears, however, to be a diffuse plant with slender variously bent branches. We have also before

Digitized by Google

us an allied species from St Vincents, which we have received from Dr Hooker: but in it (perhaps a variety of *D. scorpiurus*, Desv.) the stems are herbaceous and only slightly hispid, the stipules though small are auricled, the racemes axillary and few-flowered, and the legumes slightly contracted at both sutures between the long joints.

§ 2. *Flowers 2–3 from each bractea: racemes straight, before expansion cone-like and imbricated with large concave bracteas, afterwards elongated and lax.*

a. Leaves 3-foliolate; the lateral leaflets much the smaller and occasionally wanting: calyx campanulate, shortly 5-toothed: alæ shorter than the keel: legumes straight on the one suture, slightly crenated on the other; joints nearly square, straight on the one suture, slightly convex on the other, truncated at both ends.

701. (10) D. *gyrans* (DC.:) suffrutescent, erect, twiggy: branches rather slender, angled, glabrous: leaves petioled, trifoliolate; leaflets narrow-oblong or oblong-lanceolate, obtuse at both ends, glabrous above, adpressed-pubescent beneath; the lateral pair very small: racemes axillary and terminal, numerous towards the top of the branches, and forming together a large panicle: bracteas broadly cordate, concave, before expansion densely imbricated over the flowers, caducous: flowers short-pedicelled: stigma elongated laterally and as if 2-cleft: legume flat, pubescent, straight on the upper margin, crenated on the lower, 10–12-jointed.—*DC. prod.* 2. *p.* 326; *Wall.! L. n.* 5725; *Wight! cat. n.* 783.—Hedysarum gyrans, *Linn. suppl. p.* 332; *Jacq. ic. rar. t.* 562; *Spr. syst.* 3. *p.* 312; *Roxb. fl. Ind.* 3. *p.* 351; *in E. I. C. mus. tab.* 1082.

In Dr Wight's herbarium there is a specimen from Dr Royle, gathered in Bengal, in which the terminal leaflet is much broader and more elliptic than usual, and the legume is glabrous: it may, however, prove a distinct species (*D. Roylei*, W. & A.)

* 702. (11) D. *gyroides* (DC.:) herbaceous, diffuse: branches angled, clothed with short soft white hairs: leaves 3-foliolate; leaflets obovate-elliptic, obtuse, upper side glabrous, under whitish pubescent, almost silky on the margin and nerves beneath; terminal leaflet 3–4 times larger than the lateral ones: stipules lanceolate-subulate: racemes axillary and terminal, forming a panicle at the ends of the branches: bracteas broadly cordate, pointed, pubescent, before expansion densely imbricated like a cone, soon deciduous: vexillum about half the length of the keel: style marked with a transparent line; stigma obtuse: legumes hirsute, straight on the one suture, slightly crenated on the other.—*DC. prod.* 2. *p.* 326; *Wall.! L. n.* 5728; *Wight! cat. n.* 782.—Hedysarum gyroides, *Roxb. hort. Bengh. p.* 57 (omitted in the fl. Ind.)

b. Leaves 1–3 foliolate; lateral leaflets nearly as large as the terminal one: calyx divided to beyond the middle; upper lip shortly bifid: keel with a thorn or spur (as in *Indigofera*) on each side about the middle: legume straight on the one suture, notched to the middle on the other*.

703. (12) D. *polycarpum* (DC.:) suffruticose, procumbent, branched, often rooting at the joints: branches slightly angled, usually with white adpressed pubescence, but often with white spreading hairs on the young shoots: leaves trifoliolate; leaflets from exactly oval and obtuse at both ends to obovate-retuse or mucronate; upper side glabrous or very sparingly pubescent; under reticulately veined, usually pubescent, sometimes covered with long soft white silky down; lateral leaflets rather smaller than the terminal one,

* Perhaps this subsection ought to be conjoined with the last; the alæ in both (in the dried specimen) appear as if cohering with the keel. In *D. rufescens* the alæ are as long as the keel, but in *D. angulatum* they are shorter, as in *D. gyrans*: in the subsection *a*, on the other hand, we have also observed traces of spurs on the keel, but the imperfection of our specimens prevents our feeling certain on this point. At present, then, they must be regarded as principally distinguished by the calyx and legume.

Digitized by Google

sometimes wanting: petiole slightly margined: stipules acuminated, deciduous: racemes axillary and terminal, many-flowered: bracteas broadly ovate, pointed, pubescent, before expansion densely imbricated: pedicels nearly glabrous: keel narrow, straight, incurved at the apex, longer than the alæ: legumes erect, hispid, 5–6-jointed, straight on the one margin, notched into the middle on the other.—*DC. prod.* 2. *p.* 334 (not *Wall.*); *Hook. and Arn.! in Bot. Beech. Voy. p.* 180; *Wight! cat. n.* 780, 784, 786, 787, 791, *a.*—D. heterocarpum, *DC. l. c. p.* 337.—D. capitatum, *DC. l. c. p.* 336.—D. angulatum, *DC. l. c. p.* 335; *Wall.! L. n.* 5729 (excl. *o*).—D. tenue, *Graham! in Wall.! L. n.* 5730.—D. serpens, *Wall.! L. n.* 5733.—D. purpureum, *Hook. and Arn.! l. c. p.* 62.—D. siliquosum, *DC. l. c. p.* 336.—D. Hippocrepis, *DC.? l. c. p.* 338.—Hedysarum, n. 298, *Linn.! fl. zeyl.*—H. heterocarpum, *Linn. sp. p.* 1054; *Spr. syst.* 3. *p.* 312.—Hedysarum polycarpum, *Lam. ill. t.* 628. *f.* 4; *Poir. enc. meth.* 6. *p.* 413; *Spr. l. c. p.* 314.—H. capitatum, *Burm. Ind. p.* 167. *t.* 54. *f.* 1; *Spr. l. c. p.* 320.—H. conicum, *Poir. enc. meth.* 6. *p.* 419.—H. siliquosum, *Burm. Ind. p.* 169. *t.* 55. *f.* 2.—H. purpureum, *Roxb. fl. Ind.* 3. *p.* 358; *in E. I. C. mus. tab.* 1279.—Hippocrepis barbata, *Lour.?—Burm. zeyl. t.* 53. *f.* 1, 2; *Pluk. t.* 433, *f.* 3.

By an examination of numerous specimens from various parts of the Peninsula and of Bengal, Ceylon, Nepaul, Penang, China, and Gambier's Island in the Pacific Ocean, we have now brought together this formidable number of synonyms: it is also probable that the list must be yet swelled out, several additional allied species being described by De Candolle without fruit, from which good characters in this intricate genus must be principally obtained. As to *Hed. heterocarpum*, Linn., it is remarkable that, among the five specimens in Hermann's herbarium, from which the original description was taken, none show the abortion of the upper joints of the legume: this is however a character of no importance, as it is an accident that happens to one raceme and not to another on the same branch; and for this reason we have retained the specific appellation given by Lamarck and Poiret, in preference to that by Linnæus.

704. (13) D. *rufescens* (DC.:) shrubby: branches, racemes, bracteas, pedicels, stipules, petioles, and nerves of the leaves beneath, densely clothed with yellowish-brown tomentum: leaves trifoliolate; leaflets oval, obtuse with a long bristle; upper side glabrous; under densely clothed except the nerves with adpressed silky white hairs, especially when young: stipules caducous: racemes axillary and terminal, many-flowered: bracteas ovate, tapering to a long subulate point, before expansion densely imbricated, soon caducous: vexillum large, obcordate: alæ as long as the broad keel: legume pubescent, about 7-jointed, straight on the one suture, notched into the middle on the other.—*DC. prod.* 2. *p.* 335; *Wight! cat. n.* 785.—D. ferrugineum, *Wall.! L. n.* 5732.—Hedysarum rufescens, *Spr. syst. suppl. p.* 292.——Neelgherries.

A very elegant species, with pretty large flowers.

c. Leaves trifoliolate: legumes even or repand on the one margin, very deeply notched on the other; joints semi-oblong or rhomboid, longer than broad.

705. (14) D. *strangulatum* (W. & A.:) herbaceous, erect?: branches hairy, somewhat 3-angled, angles obtuse: leaves 3-foliolate, long-petioled: leaflets pubescent on both sides, lateral ones obliquely ovate, terminal one rhomboid: stipules scariose, oblong-lanceolate, concave, glabrous: racemes hairy, axillary and terminal, panicled, at first oblong and imbricated with large oblong concave hairy bracteas, afterwards becoming very long and lax, few-flowered: flowers 2–3 together, on long filiform pedicels: calyx campanulate, bilabiate; upper lip emarginate, under deeply cleft: vexillum obovate; alæ shorter than the keel: stamens monadelphous from the base to the middle, diadelphous towards the apex: ovary stipitate, about 4-ovuled: legume 2–3-jointed

Digitized by Google

(occasionally from abortion 1-jointed), much contracted on one suture between the joints, even on the other, hispidly pubescent; joints semi-oblong, nearly equal at both ends.—*Wight! cat. n.* 772, 773, 774.

We have not been able to find this in Wallich's List, although n. 772 was sent to him by Dr Wight. Its nearest affinity is with *D. podocarpum* (Wall.! L. n. 5711), but in that species the leaflets are acuminated, and the joints of the legume semi-obcordate: in both, as well as in some allied North American species, as *D. nudiflorum* and *D. canadense*, the stamens are monadelphous at the base; but that character is not, we fear, exclusively connected with the structure of the legume; at least some species with a similar legume, as *D. paniculatum*, have the stamens distinctly diadelphous from the base: in the North American species little attention has, however, been paid to the presence or absence of large imbricating bracteas, or to the stamens being monadelphous at the base.

§ 3. *Peduncles axillary or terminal, 1–3-flowered, or bearing a capillary divaricating raceme. Calyx deeply divided; segments lanceolate-subulate. Stamina monadelphous. Legumes 3–6-jointed, even or repand on the one suture, notched into about the middle on the other, dehiscent: joints as broad as long.—Suffruticose. Stems procumbent, diffuse, branched, filiform. Leaves simple or trifoliolate, small.*

706. (15) D. *triflorum* (DC.:) procumbent, diffuse: leaves trifoliolate; leaflets orbicular, obovate, or obcordate, more or less pubescent or hairy: stipules scariose, lanceolate; peduncles axillary, solitary or fascicled, 1–3-flowered: calyx-segments acuminated: vexillum obovate with a long claw: style bent acutely near the summit, and tumid at the angle: legume hispidly pubescent, 3–6-jointed, notched into the middle on the lower margin, even on the other; joints truncated at both ends.—*Wall.! L. n.* 5734.—Hedysarum, n. 297; *Linn.! fl. Zeyl.*—H. triflorum, *Linn. sp. p.* 1057.—*α, majus*; stems hairy; leaflets roundish or obovate, pubescent; peduncles usually solitary, sometimes in pairs, longer than the leaves, 1–3-flowered; legumes 3–4-jointed, straight.—*Wight! cat. n.* 779 (partly), 781.—D. heterophyllum, *DC. prod.* 2. *p.* 334; *Wall. L. n.* 5701.—Hedysarum heterophyllum, *Willd. sp.* 3. *p.* 1201.—H. reptans, *Roxb. fl. Ind.* 3. *p.* 354. *Burm. Zeyl. t.* 54. *f.* 1.—*β, minus*; stems hairy; leaflets obcordate, glabrous on both sides; peduncles simple, 3–6, fascicled, shorter than the leaves; legumes 5–6-jointed, slightly recurved.—*Wight! cat. n.* 777, 779 (partly).—D. triflorum, *DC. l. c.*—Hedysarum triflorum, *Willd. l. c. p.* 1202; *Spr. syst.* 3. *p.* 318; *Roxb. l. c. p.* 353; *in E. I. C. mus. tab.* 405.—D. stipulaceum, *Burm. Ind. t.* 54. *f.* 2.—Æschynomene triflora, *Poir.*—*Burm. Zeyl. t.* 54. *f.* 2.—*γ, villosum*; whole plant, except the upper surface of the leaves, covered with long white silky hairs; leaflets obovate, emarginate; peduncles simple, fascicled, about 3 together, shorter than the leaves; legume recurved.—*Wight! cat. n.* 778.

A most common and widely distributed plant, which in India supplies the place of the species of *Trifolium* and *Medicago* in Europe, springing up in all soils and situations, varying much in size and degree of pubescence as well as in inflorescence according to its place of growth and the season of the year: we have therefore no hesitation in following Linnæus in the Flora Zeylanica; and we feel convinced that its subdivision into species originated in a practice among authors of making descriptions from solitary specimens of different forms, instead of from a series of them.

707. (16) D. *parvifolium* (DC.:) procumbent, diffuse: branches triangular, usually very hairy towards their extremity: leaves trifoliolate; leaflets from oval to orbicular, mucronate, clothed with adpressed white hairs principally on the lower side: stipules scariose, about the length of the petiole, lanceolate, bristle-pointed: racemes terminal or leaf-opposed, lax few-flowered, capillary,

Digitized by Google

flexuose and divaricating: pedicels long, slender: bracteas hairy, oblong-acuminated, concave, at first loosely imbricated, soon deciduous: calyx-segments acuminated: legume slightly pubescent, 3–4-jointed, crenated on the upper suture, deeply notched on the lower; joints nearly orbicular.—*DC. prod.* 2. *p.* 334; *Wall.! L. n.* 5700; *Wight! cat. n.* 776.—Hedysarum parvifolium, *Spr. syst.* 3. *p.* 318; *suppl. p.* 293.—H. tenellum, *Don. prod. fl. Nep.* 243.

In habit this approaches very closely to *D. triflorum*, but is readily distinguished by the inflorescence.

708. (17) D. *reniforme* (DC.:) procumbent, diffuse, branched: branches terete, glabrous, filiform: leaves simple, petioled, roundish reniform, very obtuse or emarginate, glabrous on both sides: flowers axillary and solitary, or in terminal racemes: legumes 5–6-jointed, mucronate, glabrous, even on the one suture, notched on the other.—*DC. prod.* 2. *p.* 327; *Wall.! L. n.* 5702.—Hedysarum reniforme, *Linn.! sp. p.* 1051; *Burm. Ind. t.* 52. *f.* 1; *Spr. syst.* 3. *p.* 319.

XXXII. DICERMA. *DC.*

Calyx with two adpressed bracteoles, bilabiate: upper lip quite entire or scarcely 2-toothed at the apex; lower trifid, the middle segment slightly longer than the others. Corolla papilionaceous: vexillum obovate; the keel about equal with the alæ, obtuse, not obliquely truncated. Stamens monadelphous below the middle, diadelphous (9 and 1) towards the apex, permanent: anthers all roundish. Legumen 2- (or occasionally 3-) jointed: joints orbicular, flat, regular, membranaceous, reticulated with veins, not echinated, 1-seeded; the last joint bearing the remains of the style at the middle between the two sutures.—Shrubs. Leaves 3-foliolate. Flowers yellowish. Pedicels 1-flowered, aggregated in the axils of bracteas or leaves.

It is almost impossible to point out a character to distinguish this from *Desmodium*, except the fewer joints to the legume; but the difference in general appearance is considerable.

709. (1) D. *pulchellum* (DC.:) stem erect: stipules free from the petiole and from each other: leaves long-petioled, pinnately trifoliolate; leaflets elliptic-oblong, pubescent beneath, glabrous above, terminal one the largest, all furnished with partial stipules: floral leaves bifoliolate, the odd one abortive, the lateral ones orbicular and bractea-like, the petiole ending in a bristle nearly as long as the lateral leaflets: flowers aggregated: pedicels short: bracteoles caducous: legumes 2- or sometimes 3-jointed, glabrous on the sides, villous on the sutures.—*DC. prod.* 2. *p.* 339; *Wall.! L. n.* 5737; *Wight! cat. n.* 796.—Hedysarum, n. 292, *Linn.! fl. Zeyl.*—H. pulchellum, *Linn. sp. p.* 1053; *Roxb.! fl. Ind.* 3. *p.* 361; *in E. I. C. mus. tab.* 1613.—Phyllodium pulchellum, *Desv.*—Zornia pulchella, *Pers. syn.* 2. *p.* 318; *Spr. syst.* 3. *p.* 311.—*Burm. Zeyl. t.* 52; *Pluk. t.* 433. *f.* 7.

From this species *D. elegans*, DC. (or *Desmodium lutescens*, DC.) may be recognised by the leaves being velvetty on the upper surface, and by the petiole of the floral-leaves ending a bristle that scarcely exceeds the partial petiole of the lateral leaflets: we have both species from China.

710. (2) D. *biarticulatum* (DC.:) diffuse: stipules free from the petiole, but cohering together to near their apex: leaves short-petioled, palmately trifoliolate; leaflets nearly equal in size, without partial stipules, obovate-oblong, obtuse, nearly glabrous: floral-leaves abortive: flowers 2–4 together in the axils of stipules, and forming naked racemes: legumes 2-jointed, clothed with adpressed hairs.—*DC. prod.* 2. *p.* 339; *Wall.! L. n.* 5738; *Wight! cat. n.* 795.—Hedysarum, n. 296, *Linn.! fl. Zeyl.*—H. biarticulatum, *Linn.*

Digitized by Google

sp. p. 1054; *Spr. syst.* 3. *p.* 312; *Roxb. fl. Ind.* 3. *p.* 359; *in E. I. C. mus. tab.* 397.—*Burm. zeyl. t.* 50. *f.* 2.

XXXIII. ELEIOTIS. *DC.*

Calyx campanulate, 5-toothed or 5-cleft. Corolla papilionaceous: vexillum obovate: keel obtuse. Stamens diadelphous (9 and 1), permanent. Legume compressed, composed of 1–2-joints, parchment-like, the upper suture straight and thicker than the other: joints semioval, not prickly, 1-seeded. Seeds oblong, scarcely compressed, attached by their middle.—Slender, herbaceous, procumbent plants. Stems triangular. Stipules small, distinct from each other, adpressed, acute. Leaves petioled, pinnately 1–3-foliolate, nearly glabrous. Racemes axillary, much longer than the leaves. Flowers distant, small, in pairs, on slender 1-flowered pedicels.

We have retained this genus more on account of its distinct habit than any positive character by which it can be distinguished from *Desmodium*. The legumes are quite peculiar; the joints are scarcely like those of *Desm. strangulatum*, with which alone, among Indian plants, they can be compared.

711. (1) E. *sororia* (DC.:) leaves trifoliolate, the lateral leaflets near the base of the common petiole, oblong-ovate, very small or often entirely abortive; terminal one many times larger than the others, reniform-orbicular, emarginate at both ends, often variegated: calyx truncated, obscurely 5-toothed: legume 1-jointed, 1-seeded; joints slightly bluntish at both ends.—*DC. prod.* 2. *p.* 348; *Wall.! L. n.* 5741; *Wight! cat. n.* 771.—E. monophylla, *DC. l. c.*—Hedysarum sororium, *Linn.!*; *Roxb. fl. Ind.* 3. *p.* 352; *in E. I. C. mus. tab.* 396.—Hallia sororia *Willd. sp.* 3. *p.* 1170; *Spr. syst.* 3. *p.* 195.—Onobrychis sororia, *Desv.*—Glycine monophylla, *Burm. Ind. p.* 161. *t.* 50. *f.* 2.—*Petiv. gaz. t.* 32. *f.* 1; *Pluk. t.* 105. *f.* 2.

De Candolle's two supposed species may be seen springing from the same root, and even occur on different branches of the same individual.

712. (2) *Rottleri* (W. & A.:) leaves trifoliolate; leaflets about equal in size, obovate-orbicular, slightly retuse, mucronate: calyx bilabiate, upper lip bifid, lower 3-partite; segments all short: legume 1–2-jointed; joints separated by a very narrow neck, 1-seeded, acute at both ends, upper one beaked with the permanent base of the style.—*Wight! cat. n.* 770.—Hedysarum orbiculatum, *herb. Rottl.!*——Mysore.

XXXIV. LESPEDEZA. *Michaux.*

Calyx with two bracteoles at its base, 5-partite; segments about equal. Corolla papilionaceous: keel transversely obtuse. Stamens diadelphous (9 and 1). Legume lenticular, compressed, flat, indehiscent, unarmed.—Stems herbaceous or suffrutescent. Leaves pinnately trifoliolate. Stipules setaceous. Spikes or racemes peduncled or racemose. Bracteas 3-cleft, 2-flowered. Flowers purplish, or yellowish with the vexillum spotted with purple, more rarely white.

†713. (1) L.? *Indica* (Spr.:) shrubby: stem erect, somewhat tomentose: petiole filiform, longish: leaflets roundish-ovate, villous; nerves beneath clothed with rusty tomentum: racemes solitary in the axils of the lower leaves, fascicled (3–6) in the axils of the upper ones, 4–6-flowered: calyx villous: legume rhomboid-ovate, pubescent, coriaceous, about the length of the calyx.—*Spr. syst.* 3. *p.* 202.—Flemingia Rothiana, *DC. prod.* 2. *p.* 351.—Hallia trifoliata, *Roth, nov. sp. p.* 352.

Digitized by Google

B. *Leaves simple: flowers racemose or spiked: legumes more or less terete.*—Alhageæ, *DC.*

XXXV. ALHAGI. *Tourn.*—Manna. *Don.*

Calyx 5-toothed, the teeth small and nearly equal in size. Corolla papilionaceous: petals about equal in length; vexillum obovate, folded together; keel straight, obtuse. Stamens diadelphous (9 and 1). Ovary linear, with several ovules. Style filiform, glabrous, acute. Legume stalked, somewhat woody, terete, few-seeded, contracted here and there irregularly with partitions, not separating into distinct pieces in maturity. Seeds reniform.—Suffrutescent or herbaceous plants. Leaves simple. Stipules very small. Peduncles axillary, spinescent. Flowers few, reddish, arranged in racemes along the pecuncles.

714. (1) A. *Maurorum* (Tourn.:) stem shrubby: leaves obovate-oblong, glaucous beneath, glabrous: calyx longer than the pedicels, the teeth acute. —*DC. prod.* 3. *p.* 352; *Wall. L. n.* 5760; *Wight! cat. n.* 839.—A. mannifera, *Desv.*—Hedysarum Alhagi, *Linn. sp. p.* 1051; *Spr. syst.* 3. *p.* 316; *Roxb. fl. Ind.* 3. *p.* 344.—Manna hebraica, *Don.*

XXXVI. ALYSICARPUS. *Neck.; DC.*

Calyx persistent, tubular or slightly campanulate, deeply 4-cleft, with the upper segment bifid; segments equal in length. Corolla papilionaceous. Stamens diadelphous (9 and 1). Legumes terete or slightly compressed, composed of several 1-seeded joints that separate at maturity.—Herbaceous or suffruticose. Stipules and bracteas scariose. Leaves simple, entire, linear oval or roundish, often presenting all these forms on the same species. Racemes leaf-opposed, or terminal. Flowers pedicelled, usually in pairs, embraced before expansion by a deciduous bractea, purplish, about the length of the calyx.

§ 1. *Calyx scarcely exceeding the lower joint of the legume, 4-cleft to the middle: upper segment deeply bifid; all of them more or less subulate and rigid, in fruit patulous and quite distinct from each other (the edges not overlapping) at their base.*

a. Joints of the legume orbicular, smooth (without reticulations).

715. (1) A. *monilifer* (DC.:) suffruticose, diffuse: branches hairy: leaves orbicular or cordate-ovate and obtuse, glabrous: stipules about the length of the petiole: racemes leaf-opposed, short; flowers in pairs, approximated: calyx scarcely so long as the lower joint of the legume, between tubular and campanulate, deeply 4-cleft, the upper segment bifid; segments rigid, subulate, in fruit distinct and slightly spreading: legumes 4–6-jointed, moniliform, much contracted between the joints; joints globose, smooth, clothed with a hooked pubescence.—*DC. prod.* 2. *p.* 353; *Wall.! L. n.* 5769. *c.*; *Wight! cat. n.* 806.—Hedysarum moniliferum, *Linn.! mant. p.* 102; *Burm. Ind. t.* 52. *f.* 3; *Roxb. fl. Ind.* 3. *p.* 345; *Spr. syst.* 3. *p.* 316.—*Petiv. gaz. t.* 26. *f.* 4.

Of Wall. L. n. 5769 we have not seen any letters but the one to which we have referred.

b. Joints of the legume reticulated or wrinkled irregularly.

716. (2) A. *nummularifolius* (DC.:) suffruticose, procumbent, diffuse: stems branched, glabrous, or slightly pubescent towards the base: leaves

Digitized by Google

oval, obtuse, cordate at the base, sometimes varying to linear, glabrous or pubescent beneath: stipules equal to the petioles, sheathing the branches: racemes shortish; flowers approximated: calyx deeply 5-cleft; segments subulate, rigid, distinct and slightly spreading when in fruit: legume several times longer than the calyx, nearly cylindrical, not contracted between the joints; joints thickened at their line of junction, glabrous, reticulated.—*DC. prod.* 2. *p.* 353; *Wall.! L. n.* 5767, *a, b, d* (we have not seen *c*); *Wight! cat. n.* 807, 808 (partly).—A. varius, *Wall.! L. n.* 5768, *a, b.*—A. diversifolius, *Wall.! L. n.* 5772. *b* (the others not seen).—Hedysarum nummularifolium, *Willd. sp.* 3. *p.* 1173; *Spr. syst.* 3. *p.* 319.—H. cylindricum, *Poir. enc. meth.* 5. *p.* 400.—*Petiv. gaz. t.* 26. *f.* 1; *Burm. Zeyl. t.* 49. *f.* 1.

This species was taken up by Willdenow in consequence of Linnæus's reference to Petiver, but the plant of the Flora Zeylanica and in Hermann's herbarium, which Linnæus described, is *Indigofera echinata.* De Candolle, on the authority of Burmann's herbarium, refers the tab. 49. f. 1. of the Thes. Zeyl. to *A. vaginalis:* the figure and description, however, belong unquestionably to the present species.

717. (3) A. *vaginalis* (DC.:) suffruticose, diffuse: branches covered more or less with spreading hairs: leaves from oval-obtuse and cordate at the base to cordate-lanceolate or narrow linear, slightly hairy on the mid-nerve beneath: stipules equal to or exceeding the petioles: racemes terminal, elongated; flowers in rather distant pairs: calyx somewhat campanulate at the base, 5-cleft to beyond the middle; segments strongly nerved and somewhat hairy, distinct and somewhat spreading in fruit: legume 3–6-jointed, several times longer than the calyx, slightly moniliform or contracted between the joints; joints a little inflated, reticulated, pubescent, often slightly thickened at the line of junction.—*DC. prod.* 2. *p.* 353; *Wight! cat. n.* 804, 805, 808 (partly).—A. diversifolius, *Wall.! L. n.* 5772. *c* (not *b*, we have not seen *a*).—A. Rubibarna, *Wall.! L. n.* 5771. *a, c* (partly), *d* (partly, *b* not seen).—Hedysarum, n. 287, *Linn.! fl. Zeyl. p.* 133.—H. vaginale, *Linn.! sp. p.* 1051; *Spr. syst.* 3. *p.* 319; *Roxb. fl. Ind.* 3. *p.* 345.—H. varium, *Roth, nov. sp. p.* 354.—H. bupleurifolius, *Roxb. fl. Ind.* 3. *p.* 346; *in E. I. C. mus. tab.* 392.—*Pluk. t.* 59. *f.* 3 (bad).

The Linnæan herbarium contains three specimens under this name: one is the true plant; the two others belong to *A. nummularifolius.*

§ 2. *Calyx 4-cleft to near the base: upper segment slightly bifid, emarginate, or entire; all of them oblong or oblong-lanceolate, glumaceous, striated, in fruit erect with the edges overlapping each other, particularly at the base, and forming a kind of tube that encloses the legume either entirely or its lower half.*

a. Joints of the legume smooth (without reticulations).

718. (4) A. *bupleurifolius* (DC.:) suffruticose, diffuse, glabrous: leaves short-petioled, linear-lanceolate, acute: stipules longer than the petioles: racemes terminal, elongated, few-flowered; flowers short pedicelled, in distant pairs: calyx cleft to beyond the middle: segments lanceolate, acute, striated, glabrous, ciliated at the apex: legumes glabrous, 3–5-jointed, somewhat cylindrical and scarcely contracted between the joints, from about as long to twice as long as the calyx; joints smooth.—*DC. prod.* 2. *p.* 352; *Wall.! L. n.* 5671. (excl. *f.*); *Wight! cat. n.* 803.—A. ludens, *Wall.! L. n.* 5762. *c, d, e* (not *f*, the others not seen).—Hedysarum bupleurifolium, *Linn.! sp. p.* 1081.—H. gramineum, *Retz, obs.* 5. *p.* 26; *Roxb. fl. Ind.* 3. *p.* 646; *Spr.? syst.* 3. *p.* 319.

b. Joints of the legume reticulated irregularly.

719. (5) A. *longifolius* (W. & A.:) herbaceous, erect, branched: stems te-

Digitized by Google

rete, glabrous: leaves short-petioled, linear-lanceolate, somewhat obtuse, slightly cordate at the base, glabrous above, a little pubescent beneath: stipules large, longer than the petioles: racemes spike-like, very long, pedicels short, approximated: calyx 4-cleft to near the base; segments erect, overlapping at the edges, oblong, striated, hairy, ciliated, upper one shortly bifid: legume slightly contracted between the seeds, reticulated, pubescent, 5–6-seeded, about twice the length of the calyx.—*Wight! cat. n.* 809.—A. vaginalis, *Wall.! L. n.* 5763. *c* (partly).—Hedysarum longifolium, *Rottl.; Spr. syst.* 3. *p.* 319.——Corn-fields near Ongole, in the Northern Circars; December 1831.

About 4 or 5 feet high, and is, as far as we know, the largest of the genus: the leaves are from 6 to 7 inches long, but are less than 1 inch broad. We have no doubt of this being Sprengel's and Rottler's plant, although the leaves be described ovate-lanceolate and elongated.

c. Joints of the legumes transversely wrinkled.

720. (6) A. *styracifolius* (DC.:) biennial: branches diffuse, hairy: leaves short-petioled, from cordate-oval to linear-lanceolate, a little hirsute beneath, glabrous above: stipules as long as the petioles, and with the bracteas ciliated with long hairs on the margins: racemes terminal or leaf-opposed, short, dense, hairy: calyx 4-partite; segments erect, glabrous on the back, plumose-ciliated, oblong-lanceolate, striated, upper one very shortly bifid at the apex: legume glabrous, 2–4-jointed, much contracted between the joints, scarcely longer than the calyx: joints transversely rugulose.—*α*; leaves cordate-oval.—*Wight! cat. n.* 802.—A. styracifolius, *DC. prod.* 2. *p.* 353. (excl. syn.)—A. pilifer, *Wall.! L. n.* 5765.—A. cylindraceus, *Desv.* (according to *Desv. in ann. sc. nat.* 9. *p.* 417.)—Hedysarum styracifolium, *Spr.? syst.* 3. *p.* 319. (not *Linn.*)—*β*; leaves from oblong to linear-lanceolate.—*Wight! cat. n.* 987.—A. scariosus, *Graham! in Wall.! L. n.* 5766.—Hedysarum scariosum, *herb. Madr.!; Spr. l. c.*—H. glumaceum, *Koen.!; Roxb. fl. Ind.* 3. *p.* 647; *Roth, nov. sp. p.* 355 (not *Willd.*, nor *Vahl*).

We have retained the name given by De Candolle, being the oldest: but it originated in a mistake; the Linnæan *Hed. styracifolium* is so totally unlike, that we are at a loss to conjecture how such an error could have taken place.

721. (7) A. *Wallichii* (W. & A.:) erect or somewhat procumbent, branched: stems and branches glabrous: leaves cordate-oval to linear-acuminated: stipules erect, sheathing the branches, longer than the petioles: racemes terminal, dense when in flower, elongating more or less in fruit: flowers on rather slender pedicels: calyx 4-partite; segments erect, oblong-lanceolate, glabrous, slightly ciliated, overlapping at the edges, striated, upper one emarginate: legume glabrous, somewhat compressed, 3–4-jointed, shorter than the calyx, much contracted between the joints; joints transversely rugulose.—A. glumaceus, *Wall.! L. n.* 5764 (not *DC.*).—A. bupleurifolius, *Wall.! L. n.* 5761. *f.*—A. ludens, *Wall.! L. n.* 5762. *f.*—A. vaginalis, *Wall.! L. n.* 5763. *c* (partly).—Hedysarum bupleurifolium, *Spr.? syst.* 3. *p.* 319 (not *Linn.*).

When we compared Wallich's specimens (in the Linnæan Society's herbarium) of this genus with our own, we unfortunately omitted to commit to writing our notes on Wall. L. n. 5763. *a*, *b*; these letters, however, probably belong to this species.

722. (8) A. *Heyneanus* (W. & A.:) erect, sparingly branched, all over pubescent except the glabrous upper surface of the leaves and calyx: leaves very short-petioled, broadly ovate, retuse, mucronate: stipules longer than the petioles: racemes axillary and terminal, short, dense, elongating in fruit: calyx glabrous, 4-partite, all the segments acute: legume 3–5-jointed, contracted between the joints, mucronate; joints transversely rugulose, slightly

Digitized by Google

compressed, with the edges thin.—A. styracifolius, *Wall.! L. n.* 5770. *c* (*a* and *b* not seen).—Hedysarum styracifolium, *Roxb. fl. Ind.* 3. *p.* 347 (not *Linn.*)

A very distinct species, widely different in appearance from all the others of the genus.

SUBTRIBE IV.—VICIEÆ. *Bronn.*

Corolla papilionaceous. Stamens diadelphous (9 and 1). Legume continuous, not jointed. Cotyledons thick, farinaceous, during germination unchanged and remaining under ground inclosed within the seed-coat. Radicle inflexed.—Leaves abruptly pinnated (except in *Cicer* and some species of *Orobus*); the common petiole not jointed at its base with the stem, produced at the apex (unless in the above exceptions) into a bristle or tendril.*

XXXVII. CICER. *Tourn.; Gærtn. fr.* 2. *t.* 151; *Lam. ill. t.* 632.

Calyx 5-lobed; tube more or less gibbous on the upper side; lobes acuminated, 2–4 of the upper ones pressing upon the vexillum. Legume turgid, 2-seeded. Seeds gibbous, mucronate.—Herbaceous annual plants with glandular hairs. Leaves unequally or abruptly pinnated; leaflets and stipules strongly nerved. Flowers axillary, often solitary. Legume hairy.

723. (1) C. *arietinum* (Linn.:) leaves unequally pinnated; leaflets ovate, serrated, equal: stipules lanceolate, somewhat toothed: calyx scarcely gibbous, the segments as long as the alæ of the corolla.—*Linn.! sp. p.* 1040; *DC.! prod.* 2. *p.* 354; *Spr. syst.* 3. *p.* 206; *Roxb.! fl. Ind.* 3. *p.* 334; *Wall.! L. n.* 5949.

XXXVIII. ERVUM. *Linn.*

Calyx deeply 5-cleft; segments nearly equal, linear, acute, about as long as the corolla. Corolla papilionaceous. Stamens diadelphous (9 and 1): alæ longer than the keel but shorter than the vexillum. Style filiform. Stigma glabrous. Legume oblong, 2–4-seeded. Seeds orbicular or globose.—Leaves abruptly pinnated, terminated by a tendril.

724. (1) E. *Lens* (Linn.:) stem branched: leaflets oblong, about 8, somewhat glabrous: stipules lanceolate, ciliated: tendrils almost simple: peduncles 2–3-flowered, equal to the leaves, terminated by a bristle: legume broad, short, somewhat truncated, slightly inflated, reticulated, glabrous, 2-seeded: seeds compressed.—*Linn. sp. p.* 1039; *DC. prod.* 2. *p.* 366; *Spr. syst.* 3. *p.* 270; *Wall.! L. n.* 5954. *a.*—E. dispermum, *Roxb. in E. I. C. mus. tab.* 1164; *Willd. en. p.* 766; *DC. l. c.; Spr. l. c.*—Cicer Lens, *Roxb. fl. Ind.* 3. *p.* 324.

E. pendulum, Roth, is mentioned by Sprengel as a native of East India; but this assertion is gratuitous, for Roth merely says that he received the seeds of it from the Berlin Garden, under the name of *E. dispermum*, Willd.: we think it can scarcely be a variety of *E. Lens*, but is more probably *E. lenticula*, Schrad.

725. (2) E. *hirsutum* (Linn.:) stem branched: leaflets usually 10–12, linear, obtuse, mucronulate: stipules narrow, semisagittate, often pinnatifid: tendrils usually 3-cleft: peduncles few- or many-flowered, about the length of the leaves: calycine segments lanceolate-linear, equal, longer than the tube: legumes oblong, compressed, somewhat truncated, hirsute, finely reticulated, 2-seeded, drooping: seeds globose.—*Linn. sp. p.* 1039; *DC.! prod.* 2. *p.* 366; *Spr. syst.* 3. *p.* 270; *Roxb. fl. Ind.* 3. *p.* 323; *Wight! cat. n.* 824,

* We think it unnecessary to insert here, although belonging to this subtribe, and enumerated in Wallich's List as Peninsular or Bengal species, *Pisum sativum*, Wall. L. n. 5950, *Faba vulgaris*, Wall. L. n. 5951, *Lathyrus ephaca*, Wall. L. n. 5952, *L. sativus*, Wall. L. n. 5953, and *Ervum monanthos?* Wall. L. n. 5966, all of which are cultivated, and not even found in a naturalized state.

Digitized by Google

825.—E. filiforme, *Roxb.! in E. I. C. mus. tab.* 1163; *Wall.! L. n.* 5955.—E. Lens, *Wall. ! L. n.* 5954. *c.*—Vicia Mitchellii, *Raf.; DC. l. c. p.* 360.

SUBTRIBE V.—PHASEOLEÆ. *Bronn.*

Corolla papilionaceous. Stamens monadelphous, or more usually diadelphous (9 and 1). Legume several seeded, dehiscent, continuous, often with cellular, rarely with coriaceous transverse partitions between the seeds, but not separating into joints. Radicle bent along the edge of the cotyledons. Cotyledons thick, unchanged by germination.—Leaves usually trifoliolate, very rarely abruptly pinnated; primordial ones opposite.

A. *Leaves abruptly pinnated: stamens* 9, *monadelphous.*—Abrineæ.

XXXIX. ABRUS. *Linn.; Gærtn. fr. t.* 151.

Calyx campanulate, obsoletely 4-lobed with the upper lobe the broadest, or 4-toothed with the upper tooth bifid. Corolla papilionaceous; vexillum ovate. Stamens 9, monadelphous, cohering at the base with the claw of the vexillum; the tenth wanting. Style short. Stigma capitate. Legume oblong, compressed, 4–6-seeded. Seeds roundish, separated by cellular partitions.—Twining or diffuse shrubs. Leaves abruptly pinnated, with many pairs of leaflets. Pedicels springing several together from large alternate, terete, glandular tubercles along the racemes.

726. (1) A. *precatorius* (Linn.:) twining; ultimate branches with a few adpressed hairs: leaflets 8–20 pair, linear-oval obtuse at both ends, a little distant, glabrous or sprinkled with a few hairs: racemes axillary, peduncled, from half as long to as long as the leaves, many-flowered: calyx obsoletely lobed: claw of the vexillum longish, cohering with the staminal sheath at its base and forming with it a short tube around the ovary.—*Linn. syst. p.* 533; *DC. prod.* 2. *p.* 381; *Spr. syst.* 3. *p.* 235; *Desv. in ann. sc. nat.* 9. *p.* 418; *Roxb. fl. Ind.* 3. *p.* 258; *in E. I. C. mus. tab.* 1157; *Wall.! L. n.* 5818; *Wight! cat. n.* 826.—A. pauciflorus, *Desv. l. c.*—A. minor, *Desv. l. c.*—Glycine Abrus, *Linn. sp. p.* 1025.—*Rheed, Mal.* 8. *t.* 39; *Rumph. Amb.* 5. *t.* 32; *Pluk. t.* 214. *f.* 5.

727. (2) A. *fruticulosus* (herb. Madr. ! :) diffuse; ultimate branches, leaves, and racemes pubescent: leaflets approximated, narrow linear, mucronate: racemes terminating the short leafy axillary branches, few-flowered: calyx 4-toothed; teeth triangular-acute, upper one bifid at the apex: claw of the vexillum very short, cohering with the stamen-sheath only at the very base.—*Wall. ! L. n.* 5820; *Wight ! cat. n.* 827.——Palamcottah. Malabar.

B. *Leaves trifoliolate.*—Euphaseoleæ.

XL. NOMISMIA. *W. & A.*

Calyx deeply bilabiate, without bracteoles at its base: under lip longer than the upper, 3-partite, the middle segment the longest, about the length of the keel; upper bifid: all the segments bent falcately upwards, more or less subulate, in æstivation enclosing the corolla and forming a hook beyond it. Corolla papilionaceous: vexillum with two callosities near the base of the limb. Keel falcate, the petals free from the base to the bend. Stamens diadelphous (9 and 1). Ovary 1–2-ovuled. Style glabrous. Legume stalked, orbicular, much compressed, 1–2-seeded, strongly nerved or veined. Seeds with a large fleshy oval 2-lobed carunculus at the hilum.—Twining pubescent or hairy plants. Leaves petioled, pinnately trifoliolate: leaflets sprinkled

Digitized by Google

with minute glands on the under side, with very minute setaceous partial stipules at the base of the partial petioles. Racemes axillary, often springing from the very young axillary twining shoots. Calyx hairy. Legume sprinkled with hairs.

In this genus, as well as in almost all that follow of the *Phaseoleæ*, the tenth or free stamen is jointed near the base, a character which De Candolle has given to *Rynchosia* alone. Another peculiarity of structure, equally common to this group, is that of the style, which, although often compressed in the lower half, is tumid, polished, and of almost a horny texture for a considerable length below the point: it is strange that De Candolle should have overlooked this, inasmuch as that while describing *Cylista scariosa*, where he had noticed it, he supposed it to be the effect of accident.

728. (1) N. *nummularia* (W. & A.:) petioles longer than the leaves: leaflets cuneate-obovate, broader than long, retuse; racemes few-flowered, lax, much shorter than the petioles, usually on the young shoots: calyx-segments (except the lowest) about half the length of the corolla: legume strongly wrinkled with a few parallel transverse slightly branched nerves, with reticulating connecting veins, terminated by the straight mucro-like base of the style, 1-seeded.—*Wight! cat. n.* 835.—Glycine nummularia, *Linn.! mant. p.* 571; *Spr. syst.* 3. *p.* 196.—Rynchosia nummularia, *DC. prod.* 2. *p.* 386; *Wall.! L. n.* 5493.

Linnæus describes the racemes as slender and longer than the leaves, owing to having mistaken the young flower bearing shoots for racemes.

729. (2) N. *capitata* (W. & A.:) petioles about the length of the leaves: leaflets nearly orbicular with a cuneate base: racemes peduncled, many-flowered, longer than the leaves, with a slender leafless and somewhat abortive young shoot springing from about the middle of the peduncle; the floriferous portion at first somewhat lax, soon becoming very flexuose twisted up and resembling a capitulus: calyx-segments long, subulate, forming a short hooked point to the flower-bud during æstivation: vexillum not striped: legume marked with numerous close parallel transverse veins, terminated by the hooked base of the style, 2-seeded.—*Wight! cat. n.* 837.—Glycine capitate, *Heyne in Roth, nov. sp. p.* 346; *Spr. syst.* 3. *p.* 197.—Rhynchosia capitata, *DC. prod.* 2. *p.* 386.

We have not seen a specimen named by Heyne or Roth, but, with the exception of the legume being stipitate (Roth says sessile), we can perceive no essential difference between our plant and Roth's description. We have, however, specimens from Rottler's herbarium marked by him *Hedysarum aureum*, var., and given him by Heyne.

730. (3) N. *aurea* (W. & A.:) petioles about the length of the leaves: leaflets nearly orbicular, cuneate at the base, terminal one often rhomboid and slightly acute: racemes peduncled, few-flowered, flexuose, shorter than the leaves, not bearing a young shoot on the peduncle: calyx-segments long-subulate, much falcate, forming a long subulate hooked point to the flower-bud during æstivation: vexillum broad, elegantly striped longitudinally with dark-coloured veins: legumes marked with numerous close parallel transverse veins, terminated by the hooked base of the style, 2-seeded.—*Wight! cat. n.* 836.—Hedysarum aureum, *Koen.; Rottl.!*—Glycine aurea, *Willd. nov. act. nat. cur. Ber.* 4. 1803. *p.* 18.—G. elongata, *Roth, nov. sp. p.* 347; *Spr. syst.* 3. *p.* 197.—Rhynchosia aurea, *DC. prod.* 2. *p.* 386.—R. elongata, *DC. l. c.*—Dolichos rufescens, *Graham! in Wall.! L. n.* 5544.—*Pluk. t.* 52. *f.* 5 ?

XLI. RHYNCHOSIA. *Lour.; DC.*

Calyx ebracteolate, bilabiate: lower lip 3-partite, the middle segment usually the longest; upper bifid, about equal to the lower. Corolla papilionaceous, deciduous: vexillum without callosities. Stamens diadelphous

Digitized by Google

(9 and 1). Ovary 1–2-ovuled. Style glabrous. Legume obliquely ovate or oblong, or falcate, slightly compressed, 1–2-seeded. Seeds with a carunculus at the hilum.—Usually twining perennial or shrubby plants. Leaves generally pinnately trifoliolate, rarely simple. Flowers yellow, axillary, racemose or solitary.

This genus, as it stands in De Candolle's prodromus, contains several species that are much at variance with the generic character there given; and, on the other hand, there is nothing in that character to separate it from *Dolichos* and some other genera. We have already separated one genus, and perhaps the following subgenera are equally distinct. *R. virgata*, Graham! in Wall. L. n. 5503 (with which *Crotalaria tuberosa* of Don and De Candolle is the same), obviously belongs to neither of these genera; it is *Pyrrhotrichia tuberosa*, herb. Arn.: the calyx is much shorter than the corolla, about equally 5-cleft, the segments triangular and acute; the vexillum has a callous ring at the base of the limb, and the spurs each a membranaceous appendage; the fruit resembles that of *Nomismia*, to which genus it is allied in character, but not in habit.

Subgen. 1. EURHYNCHOSIA. Calyx-segments acuminated or subulate, the lowest one the longest. Keel falcate. Ovary 2-ovuled. Legume 2-seeded. Hilum and carunculus small.—Twining plants.

a. Bracteas minute or wanting: calyx shorter than the corolla: legume scimitar-shaped, several times longer than the calyx.

731. (1) R. *velutina* (W. & A.:) twining; branches, petioles, and peduncles, softly pubescent: leaves trifoliolate; leaflets roundish, cuneate at the base, mucronate; upper side slightly and softly pubescent; under hoary with a soft short tomentum, without glands: peduncles axillary, 1–2-flowered; flowers on longish pedicels: calyx somewhat campanulate; middle segment of the lower lip subulate, falcate upwards, a little shorter than the keel; other segments lanceolate, nearly twice as short as the lowest one: vexillum very pubescent on the outside, eglandular, marked on the inside above the claw with two small gibbous projections: legume scimitar-shaped, attenuated at the base, pubescent, (about 14 lines long by 4 broad), 2-seeded.—*Wight! cat. n.* 832.——Negapatam.

732. (2) R. *nuda* (DC.:) twining; branches, petioles, and racemes, pubescent: leaves trifoliolate; leaflets cuneate-roundish, rounded or retuse, nearly glabrous on both sides except the pubescent nerves beneath, not dotted with glands: racemes filiform, few-flowered, longer than the leaves; flowers distant, very shortly pedicelled, deflexed: calyx-segments subulate, the lowest one a little longer than the others; vexillum nearly glabrous, scarcely (or inconspicuously) dotted with glands, without gibbous projections on the inside: legume pubescent, scimitar-shaped, attenuated at the base, (about 7 lines long and 2 broad), 2-seeded.—*DC. mem. leg. p.* 366; *prod.* 2. *p.* 385 (where by mistake the leaves are said to be dotted); *Wight! cat. n.* 831 (partly).—Hedysarum nudum, *Rottl.*

This is only to be distinguished from the following by the want of glandular dots on the under side of the leaves; and although we retain it, we must remark that it seems to be a very doubtful species; the presence and absence of glands, size of the leaves, and the length of the racemes, being characters subject to much variation, according to the soil and exposure. We have before us a label in Rottler's handwriting, but in the distribution of No. 831. it may have been attached to a specimen not from Rottler: the specimen along with it, however, and from which we have taken our description, agrees with the character given by De Candolle in his Mem. sur les Legum., p. 366. We rather suspect that Rottler did not intend to distinguish it from the next.

733. (3) R. *medicaginea* (DC.:) twining: branches, petioles, and racemes pubescent or sometimes glabrous: leaves trifoliolate; leaflets roundish, cu-

Digitized by Google

neate at the base, obtuse or retuse, occasionally rhomboid, nearly glabrous; under side slightly pubescent or hairy on the nerves, dotted with numerous black or brownish glands: racemes few-flowered; flowers very shortly pedicelled, deflexed: calyx-segments subulate, the lowest one a little longer than the others: vexillum glabrous, dotted with glands, without gibbous internal projections: legume pubescent, sometimes nearly glabrous when mature, scimitar-shaped, attenuated at the base, (about 6 lines long and 1½ broad), 2-seeded.—α; racemes more or less elongated, lax.—*Wight! cat. n.* 831 (partly).—R. medicaginea, *DC. prod.* 2. *p.* 386.—R. nuda, *Wall.! L. n.* 5494.—R. rhombifolia, *DC. l. c.*—Dolichos medicagineus, *Lam. enc. meth.* 2. *p.* 297; *Spr. syst.* 3. *p.* 251; *Roxb. fl. Ind.* 3. *p.* 315 (as to the syn. of Willd. and Burm., but exclud. char. and descript.)—D. scarabæoides, *Roxb. l. c.* (as to char. and descr., but exclud. syn.); *in E. I. C. mus. tab.* 287. *f.* 2.—Glycine rhombifolia, *Willd. sp.* 3. *p.* 1065; *Spr. l. c., p.* 197.—*Burm. Zeyl. t.* 84. *f.* 2. —β; racemes very short, 1–3-flowered.—*Wight! cat. n.* 993.—R. ervoides, *DC. l. c.*

The legume in all the species of the genus we have seen, is, unless when very old, more or less pubescent; and we, therefore, place no dependence on that as a character: we have seen so many intermediate forms between our two varieties, that we ought perhaps to have united them. *R. microphylla*, Heyne in Wall. L. n. 5497, appears to be this species grown in a more arid soil; and *R. ternuicaulis*, Wall. L. n. 5495, seems merely a more luxuriant form with longer racemes than usual. We suspect there are very few good species in the whole genus; nor are we able to point out any satisfactory character by which to distinguish some of the West Indian species, and one before us from Juan Fernandez, from the present.

b. Bracteas oblong-lanceolate, longer than the pedicel, thin-foliaceous, somewhat permanent: calyx-segments longer than the corolla: legume oblong, a little longer than the calyx.

734. (4) R. *densiflora* (DC.:) twining, all over pubescent except the corolla: leaves trifoliolate; leaflets softly pubescent on both sides, dotted copiously on the under and sparingly on the upper with minute brownish resinous glands, acute or slightly acuminated, lateral ones obliquely broad-ovate, terminal rhomboid: racemes axillary, almost sessile, bracteated, short, dense, many-flowered; bracteas oblong-lanceolate, acuminated, a little shorter than the calyx, and with the calyx sparingly villous and dotted: calyx-segments narrow-lanceolate, subulate, longer than the glabrous corolla: legume obliquely-oblong, shortly pointed, 2-seeded, dotted, pubescent and villous.—*DC. prod.* 2. *p.* 386; *Wall.! L. n.* 5492; *Wight! cat. n.* 833.—Glycine densiflora, *Roth, nov. sp. p.* 348.—G. rhombifolia, *herb. Madr.!* (not *Willd.*).—Hedysarum punctatum, *Rottl.! in Berl. mag. p.* 231 (not *Poir.*).—H. aureum, *herb. Madr.!* (not *Rottl.*)—Desmodium punctatum, *DC. l. c. p.* 338.——Cunnawady hills.

Subgen. 2. PHYLLOMATIA. Calyx cleft to near the base: segments almost equal, oval-oblong, obtuse, foliaceous, about the length of the corolla. Keel falcate. Ovary 1–2-ovuled. Legume sessile, a little longer than the calyx, slightly compressed, obliquely roundish-oval or oblong, shortly pointed, 1–2-seeded. Seeds with a large bifid fleshy carunculus.

735. (5) R. (Ph.) *rufescens* (DC.:) diffuse or scarcely twining, densely pubescent: leaflets roundish-ovate, wrinkled, prominently reticulated underneath with the nerves and veins: racemes slender, usually elongated, few-(2–6)-flowered; flowers solitary, distant, somewhat secund: calyx-segments nearly as long as the legume, elliptic-oblong, obtuse: legume lens-shaped, short-pointed, 1-seeded, pubescent.—*DC. prod.* 2. *p.* 387; *Wight! cat. n.* 767, 768, 769.—Hedysarum rufescens, *Rottl.*—Glycine rufescens, *Willd. nov.*

Digitized by Google

act. nat. cur. Ber. 4. 1803. *p.* 222; *Spr. syst.* 3. *p.* 196.—G. Pondicheriensis, *Spr. l. c.*—Cylista suaveolens, *Graham! in Wall.! L. n.* 5587.——Soratoor, Gingie, and Cunnawady mountains.

This is certainly the *Glyc. Pondicheriensis* of Sprengel, and we have no doubt of its being also *G. rufescens* of Willdenow. Sprengel's description of a plant under the latter name in Willdenow's herbarium is no doubt slightly at variance, in as far as he states the stem to be erect and the legumes glabrous; but the former appears to twine but very slightly, and perhaps only at the extremities, and the legume, when old, has much of the pubescence rubbed off: it is possible, however, that the plant in the herbarium is not that originally described, (for Willdenow does not seem to have had a specimen when he published the genus *Glycine* in his spec. plant), and we are almost certain that ours is the plant of Rottler. It is very variable in the quantity and colour of its pubescence.

736. (6) R. (Ph.) *Heynei* (W. & A.:) diffuse, with the extremities slender but scarcely twining, densely and softly pubescent: leaflets ovate; upper side nearly even, under with prominent nerves and transverse veins: peduncles axillary, bearing 1–2 fascicles of short pedicelled flowers: fascicles distant, few-flowered, subtended by a roundish cordate bractea: calyx-segments cordate-oblong, obtuse, nearly as long as the legume: legume oblong, with a short oblique point, 2-seeded, constricted and with a cellular partition between the seeds, pubescent.—Cylista reticulata, *Heyne! in Wall.! L. n.* 5584.

Whether this be retained in *Rhynchosia*, or be separated with *R. rufescens*, the specific appellation given by Heyne is totally inapplicable when compared with its congeners.

Subgen. 3. PTYCHOCENTRUM. Calyx 4-cleft; segments acuminated, nearly equal; upper one bifid. Vexillum with the margins of the spurs and of the claw folded in: keel falcate. Ovary 2-ovuled. Legume sessile, oblong, 2-seeded. Seeds with a large fleshy bifid carunculus.—Erect shrubby pubescent plants. Leaves trifoliolate, dotted. Peduncles 1–2-flowered.

737. (7) R. (Pt.) *suaveolens* (DC.:) shrubby, erect, covered all over with a viscous pubescence: extreme young branches sometimes slender and diffuse, but scarcely twining: leaves trifoliolate; leaflets broadly ovate, acute or acuminated, inconspicuously dotted on the under side with yellowish glands: peduncles 1–2-flowered, filiform, jointed, and with a bractea at the separation of the pedicels: calyx deeply bilabiate; segments long-subulate, curved upwards, nearly as long as the corolla: legume a little compressed, pubescent, 2-seeded, contracted and with a cellular partition between the seeds.—*DC. prod.* 2. *p.* 387; *Wight! cat. n.* 760.—Glycine suaveolens, *Linn.! suppl. p.* 326; *Spr. syst.* 3. *p.* 196.—Hedysarum venosum, *herb. Madr.!*—Cajanus? suaveolens, *Graham! in Wall.! L. n.* 5579.

This is almost the only instance that we know (*R. Heynei* being another) in *Rhynchosia* of a legume with a cellular partition between the seeds; but notwithstanding that structure, we consider it more allied to the following species than to the plants with which Dr Graham has associated it: it is, however, an additional proof of the necessity of separating this subgenus.

738. (8) R. (Pt.) *cana* (DC.:) shrubby, quite erect, pubescent: leaves trifoliolate; leaflets on the older branches broadly ovate acute or acuminated, on the young shoots oblong-lanceolate acuminated, minutely dotted with resinous glands on both sides; upper slightly pubescent; under densely pubescent or almost velvetty, rugose and reticulated with the nerves and veins: peduncles axillary, 2-flowered, filiform, with a small bractea and joint at the separation of the pedicels: calyx 4-cleft to the middle, scarcely bila-

Digitized by Google

biate; segments lanceolate-acuminated, twice as short as the corolla: legume clavate-oblong, slightly inflated, pubescent, 2-seeded, without a partition.—*DC. prod.* 2. *p.* 386; *Wall.! L. n.* 5498; *Wight! cat. n.* 830.—Glycine cana, *Willd. sp.* 3. *p.* 1063; *Spr. syst.* 3. *p.* 196.—*Pluk. t.* 213. *f.* 6 (a young shoot). ——Dindygul hills. Cunnawady.

This species approaches very closely in character to *Flemingia*; so much so, that we had almost united it to that genus: it differs, however, by the habit, the calyx, and the seed: the legume is scarcely inflated.

XLII. FLEMINGIA. *Roxb.*

Calyx ebracteolate at the base, acutely 5-cleft; the four upper segments about equal, the lower one usually much longer. Corolla papilionaceous: vexillum without callosities; the spurs inflexed at the margin: keel falcate. Stamens diadelphous (9 and 1). Ovary 2-ovuled. Style glabrous. Legume sessile, oval, turgid, 2-seeded, without a partition between the seeds. Seeds nearly globose; hilum small; caruncula inconspicuous or wanting.—Shrubby or suffrutescent. Stipules scariose, lanceolate; sometimes very large, usually deciduous. Leaves petioled, digitately trifoliolate or simple: under side usually dotted with small glands; the nerves prominent, parallel, long and simple. Partial stipules wanting. Racemes axillary, solitary or aggregate, sometimes panicled. Flowers several together. Legumes more or less pubescent.

§ 1. *Leaves digitately trifoliolate: racemes straight, simple; bractea (stipule?) lanceolate, solitary to each fascicle of flowers, scariose: flowers densely imbricated before expansion: lower calyx-segment elongated, subulate.*—Flemingiastrum, *DC.*

739. (1) F. *stricta* (Roxb.:) shrubby, erect: stems numerous, with few erect branches; branches triangular: leaves trifoliolate; leaflets broadly lanceolate, acuminated, glabrous; under side minutely black dotted, the nerves numerous and densely pubescent: petiole channelled, with a short margin: stipules large, a little shorter than the petiole, lanceolate-acuminated, concave, sheathing, deciduous: racemes spiciform, solitary, the length of the petioles or sometimes longer, peduncled: bracteas lanceolate-subulate, acuminated, longer than the flowers, caducous: legume without glands, nearly glabrous.—*Roxb. cor.* 3. *t.* 248; *fl. Ind.* 3. *p.* 342; *DC. prod.* 2. *p.* 351; *Spr. syst.* 3. *p.* 194; *Wall.! L. n.* 5745 (excl. *e*); *Wight! cat. n.* 818 (partly).—Millingtonia stricta, *Roxb. in E. I. C. mus. tab.* 401.—Crotalaria macrophylla, *herb. Madr.!* (not *Willd.*)

740. (2.) F. *congesta* (Roxb.:) shrubby, somewhat erect, young parts villous: leaves trifoliolate; leaflets ovate-lanceolate; upper side nearly glabrous; under pubescent, dotted with numerous black glands, the nerves densely pubescent and rather distant: petiole nearly terete: stipules lanceolate-subulate, 5–6 times shorter than the petiole, caducous: racemes dense, oblong, rather shorter than the petiole, almost sessile, aggregated: bracteas ovate-cuspidate, shorter than the flowers, caducous: legume eglandular.—*Roxb. fl. Ind.* 3. *p.* 340; *DC. prod.* 8. *p.* 351; *Spr. syst.* 3. *p.* 194; *Wall.! L. n.* 5747 (excl. *e* partly); *Wight! cat. n.* 818.—F. semialata, *Wall.! L. n.* 5746. *b*, *e*.—Millingtonia congesta, *Roxb. in E. I. C. mus. tab.* 1278.—Crotalaria macrophylla, *Willd. sp.* 3. *p.* 982; *Spr. syst.* 3. *p.* 239.—Rhynchosia crotalarioides, *DC. l. c., p.* 387.

F. semialata, Roxb. (*Millingtonia semialata*, Roxb. in E. I. C. mus. tab. 1623) is very nearly allied, but is distinguished by the petiole being furnished with a narrow wing, and the leaflets sprinkled with a few inconspicuous yel-

Digitized by Google

lowish glands, and not copiously dotted with black ones: to it belongs Wall.! L. n. 5746. *c, d, e,* partly, (we have not seen *a* or *f*), *F. stricta,* Wall.! L. n. 5745. *e,* and *F. congesta,* Wall. L. n. 5747. *e,* partly.

741. (3) F. *Wallichii,* (W. & A.:) shrubby, erect; branches terete or obsoletely angled, young parts tomentose: leaves trifoliolate; leaflets obovate-lanceolate or rhomboid, obtuse, reticulated; upper side glabrous; under dotted with glands, densely pubescent: petiole about half the length of the leaflets, slightly winged: stipules several times shorter than the petiole, somewhat persistent: racemes axillary, short, capitate: bracteas ovate, cuspidate, somewhat persistent: hairs on the calyx springing from yellowish glands: legume nearly glabrous, free from glands.—F. semialata *var.* vestita, *Wall.! L. n.* 5746. *g.*

742. (4) F. *Grahamiana* (W. & A.:) shrubby, erect; branches terete; young shoots tomentose: leaves trifoliolate; leaflets ovate, mucronate, the nerves densely pubescent; upper side hispid; under glabrous except on the nerves and veins, copiously dotted with black glands: petiole scarcely half as long as the leaflets, villous, winged: stipules 5–6 times shorter than the petiole, persistent: racemes sessile, short, ovate, dense and capitate, 1–3 together: bracteas somewhat persistent, about the length of the flowers: calyx-segments villous, particularly on the margins, sprinkled with bright red glands, longer than the corolla: legumes pubescent, villous on the ventral suture, densely covered with clammy red glands.—*Wight! cat. n.* 816.

F. nana, Roxb. fl. Ind. 3. p. 339 (*Mill. nana,* Roxb. in E. I. C. mus. tab. 1622), appears to be very closely allied, but to differ by the racemes rather lax and a little elongated, by the common petiole as long or longer than the leaflets, and the size of the plant; "stem scarcely any, a short perennial ligneous stump, of scarcely an inch in height, is all that appears above ground, from which issue a few short subherbaceous branches, the whole height, leaves included, not above 6 or 8 inches."

743. (5) F. *Wightiana* (Grah.:) shrubby, erect, branched: branches terete, young ones angled, pubescent: leaves trifoliolate; leaflets oblong-lanceolate; upper side glabrous and slightly rugose; under densely tomentose, with a few black glands concealed by the tomentum: petiole slightly margined: stipules very caducous: racemes 2–3 together, before expansion cylindrical-oblong, densely imbricated and cone-like, afterwards more lax: bracteas ovate, acute, villous on the outside, caducous: calyx and legume without glands.—*Graham! in Wall.! L. n.* 5751; *Wight! cat. n.* 815.

Perhaps *F. ferruginea,* Wall.! L. n. 5750, is not distinct.

§ 2. *Leaves digitately trifoliolate: racemes forming a loose panicle: bracteas (stipules?) in pairs at the divisions of the panicle and base of the pedicels, minute, caducous: lower calyx-segments scarcely longer than the others; all of them shortly lanceolate: vexillum with a small gibbous scarcely callous protuberance on the inside a little above the claw.*—Chalaria.

744. (6) F. *lineata* (Roxb.:) shrubby, erect, branched: old branches terete and nearly glabrous, young ones angled and pubescent: leaves trifoliolate; leaflets obovate or oblong, cuneate at the base; upper side glabrous; under pubescent when young, afterwards glabrous, inconspicuously dotted with minute yellowish glands, the nerves densely pubescent: petiole channelled, not margined, about half the length of the leaflets: stipules deciduous, nearly half the length of the petioles: racemes arranged in a peduncled diffuse panicle: bracteas deciduous: calyx-segments about equal and with the legume pubescent and covered with minute whitish mealy glands.—*Roxb. fl. Ind.* 3. *p.* 341; *in E. I. C. mus. tab.* 1624: *DC. prod.* 2. *p.* 351; *Spr. syst.* 3. *p.* 194; *Wall.! L. n.* 5752; *Wight! cat. n.* 817.—Hedysarum lineatum,

Digitized by Google

Linn.! sp. p. 1054; *Burm. Ind. p.* 167. *t.* 53. *f.* 1.—Lespedeza lineata, *Pers. syn.* 2. *p.* 318.—Onobrychis lineata, *Desv.*

§ 3. *Leaves simple; racemes terminal or axillary, often with one or two branches; rachis flexuose: partial peduncles very short, with two scariose subulate caducous stipules at the base, bearing at their apex floral-leaves and flowers: bracteas or floral-leaves solitary, large, reniform, folded, inflated, imbricated in two opposite rows, persistent, somewhat membranous, pubescent: flowers pedicelled, several together at the apex of the peduncle, enclosed within the bractea: lower calyx-segments a little longer than the others, subulate: legume concealed within the bracteas.*

745. (7) F. *strobilifera* (Brown:) shrubby erect; branches pubescent towards the extremities: leaves simple, ovate, sometimes acuminated, blunt-pointed, glabrous above, slightly pubescent and copiously dotted with minute glands beneath: bracteas acute: legume pubescent.—*Br. in. Ait. hort. Kew.* (*ed.* 2.) 4. *p.* 350; *DC. prod.* 2. *p.* 351; *Spr. syst.* 3. *p.* 194; *Wall.! L. n.* 5753.—Hedysarum, n. 287, *Linn.! in herb. Herm.!; fl. Zeyl. t.* 3.—H. strobiliferum, *Linn. sp. p.* 1053; *Burm. Ind. p.* 165; *Roxb. fl. Ind.* 3. *p.* 350; *in E. I. C. mus. tab.* 1276.—Zornia strobilifera, *Pers. syn.* 2. *p.* 319.

The remainder of the character is the same as that of the section. We scarcely know how to distinguish *Hedys. bracteatum*, Roxb. fl. Ind. 3. p. 351 (in E. I. C. mus. tab. 1612); the shape of the leaves is too variable to afford a sufficient mark; in the drawing the bracteas are represented perfectly obtuse, but as this is not noticed in the description, we cannot place much reliance on it. *F. fruticulosa*, Wall.! L. n. 5754, and *F. abrupta*, Wall.! L. n. 5755, are perhaps also forms of our plant; but whether different varieties or different species, they are mixed indiscriminately under the several letters of both numbers.

XLIII. PHASEOLUS, *Linn.; Lam. ill. t.* 610.

Calyx campanulate 5-toothed, or bilabiate, the upper lip 2-toothed, the lower 3-partite. Corolla papilionaceous: keel with the stamens and style spirally twisted or circinate. Legume compressed or cylindrical, 2-valved, many-seeded, with more or less conspicuous cellular partitions between the seeds. Hilum of the seed oval-oblong.—Herbaceous or suffrutescent plants. Leaves pinnately trifoliolate; leaflets with partial stipules. Racemes axillary. Pedicels usually in pairs, 1-flowered.

§ 1. *Stipules sessile: legume compressed.*—Euphascolus, *DC.*

* 746. (1) P. *vulgaris* (Linn.:) annual, twining, nearly glabrous: leaflets ovate-acuminated: stipules sessile, recurved: racemes peduncled, shorter than the leaf; pedicels in pairs: bracteoles patulous: legumes pendulous, straightish, slightly torulose, long-mucronate: seed ovate, a little compressed. —*Linn. sp. p.* 1016 (*α*); *DC. prod.* 2. *p.* 392: *Spr. syst.* 3. *p.* 254; *Roxb. fl. Ind.* 3. *p.* 287.

* 747. (2) P. *nanus* (Linn.:) annual, low, erect, nearly glabrous: leaflets ovate, acuminated: stipules sessile, recurved: racemes shorter than the leaves: pedicels in pairs: bracteoles patulous, longer than the calyx: legume compressed, more or less torulose, mucronate: seed compressed.—*Linn. sp. p.* 1017; *Spr. syst.* 3. *p.* 255; *Roxb. fl. Ind.* 3. *p.* 291.—P. compressus, *DC. prod.* 2. *p.* 392.—P. saponaceus, *Savi; DC. l. c., p.* 393.—P. Romanus, *Savi.*

Probably, as has been frequently remarked, this is a mere variety of *P. vulgaris*: it is only known in a state of cultivation, and, therefore, ought to

Digitized by Google

be regarded as a very suspicious species. Savi's dissertation on these plants, with figures, is an example of how much ingenuity may be wasted in splitting species; which, when accomplished, can be of little use either to the botanist or to the gardener.

*748. (3) P. *multiflorus* (Willd.:) annual, twining, almost glabrous: leaflets ovate, acuminated: stipules sessile, recurved: racemes long-peduncled, longer than the leaves, floriferous part elongated: pedicels in pairs: bracteoles broad, about equal to or shorter than the calyx, adpressed: legumes pendulous, scimitar-shaped, long-mucronate, slightly torulose, few-seeded: seeds oblong, compressed.—*Willd. sp.* 3. *p.* 1030; *DC. prod.* 2. *p.* 392; *Spr. syst.* 3. *p.* 254; *Wight! cat. n.* 725.—P. vulgaris, β, *Linn. sp. p.* 1016.

749. (4) P. *lunatus* (Linn.:) biennial, usually twining, glabrous or pubescent: leaflets ovate, acuminated: stipules minute, reflexed, caducous: racemes shorter than the leaves, peduncled, the floriferous part elongated: pedicels in pairs: bracteoles narrow, small, shorter than the calyx, adpressed, caducous: legumes pendulous, scimitar-shaped, long-mucronate, not torulose, glabrous, 2–4-seeded: seeds oblong, compressed.—*Linn. sp. p.* 1016; *DC. prod.* 2. *p.* 393; *Spr. syst.* 3. *p.* 254; *Roxb. fl. Ind.* 3. *p.* 287; *in E. I. C. mus. tab.* 272; *Wight! cat. n.* 727.—P. vulgaris, *Wall.! I. n.* 5595.

750. (5) P. *rostratus* (Wall.:) perennial, twining, nearly glabrous; leaflets ovate, acute: stipules sessile, reflexed: racemes long-peduncled, few-flowered, shorter than the leaves: flowers in pairs, with a gland between them: alæ variously twisted; keel with a very long spirally twisted beak: legume pendulous, flat, curved, long-mucronate, scarcely torulose, nearly glabrous, many-seeded.—*Wall. pl. As. rar.* 1. *p.* 50. *t.* 63; *L. n.* 5610.—P. alatus, *Roxb. fl. Ind.* 3. *p.* 288.—P. amarus, *Roxb. in E. I. C. mus. tab.* 277.—*Rheed. Mal.* 8. *t.* 42.——Circars. Malabar.

The flowers of this species are very large, and in many respects approach it to *P. caracalla*, Linn.; a plant which, although said to be a native of India, is not to be met with in any of the Indian herbariums, and is more probably a native of South America; we have received wild specimens of it from the missions of Brazil.

751. (6) P. *Grahamianus* (W. & A.:) erect?, glabrous: leaflets ovate, acuminated: stipules sessile, small, recurved, deciduous: racemes long-peduncled, longer than the leaves, few-flowered, floriferous part slightly elongating in fruit: pedicels in pairs: legume flat, not torulose, linear, narrow and long (about 3 inches long and scarcely more than a line broad), many-seeded, glabrous; valves at length twisting: seeds oblong, compressed.—*Wight! cat. n.* 724.——Courtallum.

Our specimen is imperfect, not showing enough to enable us to determine whether the plant be a twiner, or erect: there is, however, no tendency to twine in what we have before us. We have not seen the flowers or bracteoles.

752. (7) P. *psoraleoides* (W. & A.:) erect, suffrutescent?: old branches and leaves nearly glabrous; young shoots and leaves underneath, and racemes clothed with adpressed silky pubescence: leaflets lanceolate, acute: stipules lanceolate-subulate, sessile, erect, striated, persistent: racemes 5–8 times longer than the leaves, floriferous part elongated; peduncle very long, stout, terete: pedicels in pairs: bracteas and bracteoles subulate-setaceous, longer than the calyx, caducous: calyx 5-toothed: keel circinate: legumes pendulous, nearly straight, compressed, long-linear (about 4 inches long and 1 line broad), many-seeded, pubescent; seeds compressed, short-oval, slightly truncated at both ends.—*Wight! cat. n.* 730.——Nopalry.

Although sent to Dr Wallich by Dr Wight, as probably *P. Max*, we do not find it in his List. When in flower, it bears a strong resemblance to *Psoralea bituminosa*, but it is an undoubted *Phaseolus*, and approaches so very near to *P. semierectus*, Linn., that we had almost doubts if it were specifically

Digitized by Google

distinct; the leaflets in that plant however are broader, the keel rather different, the flowers more approximated, and the legumes nearly horizontal.

§ 2. *Stipules adnate (produced and free at the base): legume cylindrical.*—Strophostyles, *Elliott.*

\+ Twining.

753. (8) P. *calcaratus* (Roxb.:) biennial, twining, villous: leaflets ovate, somewhat 3-lobed: stipules lanceolate, adnate: racemes somewhat erect, longer than the leaves; the floriferous part elongated: bracteas lanceolate, caducous: pedicels in pairs, with an intermediate gland: bracteoles somewhat permanent: keel with a remarkably long horn: legumes pendulous, cylindric, slender, nearly straight, glabrous: seeds 6–7, glabrous, nearly cylindrical.—*Roxb. fl. Ind.* 3. *p.* 289; *in E. I. C. mus. tab.* 1602; *Wall.! L. n.* 5611.——Mysore.

Found by Heyne in a cultivated state in Mysore.

*754. (9) P. *farinosus* (Linn.:) twining: leaflets ovate-rhomboid, acute, somewhat 3-lobed: peduncles slightly longer than the petiole: flowers nearly capitate: legumes terete, not torulose: seeds cylindrical, truncated at both ends, covered with a mealy tomentum.—*Linn. sp. p.* 1017; *DC. prod.* 2. *p.* 395; *Spr. syst.* 3. *p.* 254.

755. (10) P. *trinervius* (Heyne:) twining: branches and petioles covered with long spreading or deflexed hairs: leaflets of rather a hard texture, ovate, acuminated, somewhat obtusely deltoid or lobed at the base; young ones covered on both sides with copious adpressed long shining hairs, densely ciliated with short brownish hairs; old ones sprinkled with harsh adpressed hairs: stipules oblong-lanceolate, attached below the middle: peduncles elongated, straight, slightly hairy, much longer than the leaves; flowers forming a kind of cylindrical head: legume horizontal, cylindrical, hairy.—*Heyne! in Wall.! L. n.* 5603; *Wight! cat. n.* 731.—*Rheed. Mal.* 8. *t.* 37.

\+ + Not twining.

756. (11) P. *Mungo* (Linn.:) annual, nearly erect, somewhat flexuose, hairy: leaflets broadly-ovate or rhomboid, entire, acute or acuminated: stipules oblong-lanceolate, attached below their middle: peduncles at first shorter, afterwards longer than the petioles: flowers forming a kind of cylindrical head: bracteas and bracteoles lanceolate, caducous: keel twisted to the left, with a short horn or spur near the base on the left side: legume horizontal, cylindrical, somewhat slender (2–2½ inches long, and 1½ line broad), hairy, 6–15-seeded; seeds with numerous close longitudinal striæ.—*Linn. mant. p.* 101; *DC. prod.* 2. *p.* 394; *Spr. syst.* 3. *p.* 255; *Roxb. fl. Ind.* 3. *p.* 292; *in E. I. C. mus. tab.* 273; *Wall.! L. n.* 5589 (partly); *Wight! cat. n.* 995.—P. hirtus, *Retz obs.* 3. *p.* 38.—P. Max, *Roxb. fl. Ind.* 3. *p.* 295; *in E. I. C. mus. tab.* 274.—*Rheed. Mal.* 8. *t.* 50.

Roxburgh states that his *P. Max* differs only in being more branched, and in the colour of the seed being black, and not green as in his *P. Mungo*. What *P. Max* of Linnæus may have been it is difficult to decide: the synonym of Hernandez is now *P. Hernandesii* of Savi; that of Rumphius is generally also excluded: the specimen of the *Flora Zeylanica* in Hermann's herbarium is not in flower; it is very hairy all over, but does not appear a if it were an erect plant.

757. (12) P. *Wightii* (Grah.:) diffuse, flexuose, hairy: leaflets broadly ovate or rhomboid, acuminated, entire or 3-lobed; the terminal lobe acuminated, much longer than the others: stipules oblong-lanceolate, attached below their middle: peduncles elongated, about the length of the leaves: flowers few, capitate: keel twisted to the left, with a short horn near the base on the left side: legumes hairy, cylindrical, slender (about a line broad,

Digitized by Google

and 2 inches long), 8–10-seeded, ascending: seeds with numerous close obliquely longitudinal striæ, cylindrical, somewhat truncated at both ends.—*Graham! in Wall.! L. n.* 5591; *Wight! cat. n.* 726.

758. (13) P. *radiatus* (Linn.:) stems diffuse, flexuose, and with the petioles and peduncles very hairy, the hairs long and pointing downwards: leaflets hairy; lateral ones obliquely ovate, pointed; terminal one rhomboid oblong, the angle on each side rounded and resembling a small lobe: stipules oblong-lanceolate, pointed, attached below their middle: peduncles about the length of the petioles: bracteoles oblong-lanceolate, acuminated, twice as long as the calyx: flowers somewhat capitate: keel twisted to the left, without any conspicuous horn near its base: legume very hairy, cylindrical (about 2 inches long and 2 lines broad), 6–8-seeded, spreading.—*Linn. sp. p.* 1017; *DC. prod.* 2. *p.* 395; *Spr. syst.* 3. *p.* 255; *Wight! cat. n.* 732.—*Dill. Elth. t.* 315. *f.* 304 (good).

We have not examined the Linnæan specimen; but as he appears to have taken up this species, in the Hort. Ups., from a cultivated plant, and as our specimens agree remarkably well with Dillenius' figure, obtained likewise from a cultivated plant, referred to by Linnæus, and therefore probably the same with his own, we have no hesitation in considering ours to be the true one. We place no dependence on the stems being described *erect*, as in this genus Linnæus merely uses that term in opposition to twining. The synonym of Rumphius Amb. 5. (not 6.) t. 139. f. 2, referred to by Willdenow, bears no resemblance to our plant.

759. (14) P. *Roxburghii* (W. & A.:) annual, diffuse, somewhat flexuose, hairy: leaflets ovate, acuminated, slightly repand but not lobed: stipules oblong-lanceolate, attached below their middle: peduncles erect, shorter than the petioles, or equal to them when in fruit: flowers somewhat capitate: keel twisted to the left, with a very long horn near the base on the left side: legumes very hairy, cylindrical (about $1\frac{1}{2}$ inch long and 2 lines broad), few- (4–6-) seeded, nearly erect: seeds smooth, somewhat truncated at both ends.—*Wight! cat. n.* 994.—P. radiatus, *Roxb. fl. Ind.* 3. *p.* 296; *Wall. L. n.* 5592.—P. minoomoo, *Roxb. in E. I. C. mus. tab.* 275.—P. Mungo, *Wall.! L. n.* 5589 (partly).——Circars. Travancore. Malabar.

Perhaps this, with all the preceding of the section, may be referable to one species: we have only retained them in deference to other botanists.

760. (15) P. *trilobus* (Ait.:) herbaceous, procumbent, diffuse: petioles elongated: leaflets several times shorter than the petioles, roundish and entire, or 3-lobed; middle lobe cuneate-ovate or obovate, narrowed towards the base: stipules oblong-lanceolate, attached below their middle: peduncles elongated, ascending: flowers few, small, somewhat capitate: legume cylindrical, glabrous or slightly hairy.—*Roth, cat. Bot.* 2. *p.* 86; *nov. sp. p.* 344; *Spr. syst.* 3. *p.* 254; *Roxb. fl. Ind.* 3. *p.* 298; *Wall.! L. n.* 5588 (partly).—Glycine triloba, *Linn. mant. p.* 516.—Dolichos trilobus, *Linn. mant.* 1. *p.* 101; *DC. prod.* 2. *p.* 399; *Burm. Ind. t.* 50. *f.* 1.—D. stipulaceus, *Lam. enc. meth.* 2. *p.* 300.—*α*; pubescent or nearly glabrous; leaflets roundish entire.—*Wight! cat. n.* 733.—*β*; pubescent or nearly glabrous; leaflets deeply 3-lobed.—*Wight! cat. n.* 729 (partly).—P. trilobus, *Willd. sp.* 3. *p.* 1035; *DC. l. c. p.* 394.—*γ*; hairy; leaflets deeply 3-lobed.—*Wight! cat. n.* 729 (partly).—P. aconitifolius, *Roxb. in E. I. C. mus. tab.* 276 (not of the *fl. Ind.*)—*Pluk. t.* 120. *f.* 7.

We have not seen the ripe fruit or the seed, in which better characters may be looked for than we have been able to give, to separate this species from *P. Wightii*, from which it is very dissimilar in general appearance. If Plukenet's t. 214. f. 3, usually quoted under this species, actually belong to it, it is very unlike any form of it that we have seen: Roxburgh refers it to *Dolichos falcatus*, and, like it, it appears to be a twiner; but Plukenet says "*floribus exiguis*," which is quite at variance with that plant.

Digitized by Google

761. (16) P. *aconitifolius* (Jacq.:) annual, diffuse, procumbent, slightly hairy: leaflets very deeply and palmately divided into 3–5 linear-lanceolate lobes: stipules oblong-lanceolate, attached below the middle: peduncles nearly as long as the petiole: flowers somewhat capitate: legumes horizontal, cylindrical, nearly glabrous.—*Jacq. obs.* 3. *p.* 2. *t.* 52; *Linn. suppl. p.* 325; *DC. prod.* 2. *p.* 394; *Spr. syst.* 3. *p.* 254; *Roxb. fl. Ind.* 3. *p.* 299; *Wight! cat. n.* 728.—P. trilobus, *Wall.! L. n.* 5588 (partly).—P. lobatus, *Roxb. in E. I. C. mus. tab.* 1159.—Dolichos dissectus, *Lam. enc. meth.* 2. *p.* 300.

XLIV. SOJA. *Moench.*

Calyx bibracteolate at the base, 5-cleft; the three lower segments straight and acute; the three upper combined to beyond the middle. Corolla papilionaceous, scarcely longer than the calyx: vexillum ovate, somewhat cucullate and enclosing the alæ, shortly clawed: keel oblong, straight. Stamens diadelphous (9 and 1), the tenth close to the others. Sheath wanting around the base of the ovary. Style short. Legume oblong scimitar-shaped, 2–5-seeded, membranaceous, furnished with cellular partitions between the seeds. Seeds ovate, compressed.—Annual, erect, flexuose, very hairy. Leaves pinnately trifoliolate. Flowers either aggregated in the axils, or in a short axillary raceme.

* 762. (1) S. *hispida* (Moench).—*DC.! prod.* 2. *p.* 396; *Wall.! L. n.* 5529.—S. Japonica, *Savi.*—Dolichos Soja, *Linn. sp. p.* 1021; *Jacq. ic. rar. t.* 145; *Spr. syst.* 3. *p.* 251; *Roxb. fl. Ind.* 3. *p.* 314; *in E. I. C. mus. tab.* 1607.

XLV. DOLICHOS. *Linn.*

Calyx campanulate, more or less 2-lipped; the upper lip emarginate or bifid, rarely entire; the under 3-partite, the middle segment or tooth longer than the others. Corolla papilionaceous: vexillum as long as the keel, furnished near the base with (usually 2–4) callosities: alæ oblong, obtuse: keel falcate, or incurved, obtuse, neither twisted nor bent to one side. Stamens diadelphous (9 and 1). Legume 2-valved, more or less furnished with cellular partitions between the seeds: valves neither winged nor prominently nerved. Seeds oval, more or less compressed: hilum oval, small: carunculus inconspicuous.—Herbaceous or suffrutescent usually twining plants. Leaves pinnately trifoliolate. Flowers axillary, 1–2 together, usually racemose.

1. Spuriæ. *Bracteoles none at the base of the calyx: calyx deeply bilabiate.*

\+ Upper lip of the calyx entire: vexillum with a semicircular callosity at the base of the limb, and which is not decurrent along the claw.

763. (1) D.? *punctatus* (W. & A.:) twining, glabrous or very minutely pubescent: stems filiform: leaflets ovate, bluntish, longer than the common petiole, copiously dotted beneath with resinous glands: partial stipules wanting: flowers solitary, short-pedicelled, axillary or remote on the young slender leafless shoots: calyx dotted: legumes linear-oblong, nearly straight, compressed, pointed, about 6-seeded.—*Wight! cat. n.* 996.

A very doubtful species, and merely referred to here on account of the callosity on the base of the limb of the vexillum: it has considerable affinity with *Rhynchosia*, but the fruit is very unlike. The legume in the only specimen we have seen is far from being mature, and is very compressed, but the style is that of the *Phaseoleæ*.

Digitized by Google

++ Upper lip of the calyx bifid: vexillum with two callosities above the base of the limb, that are not decurrent along its claw: lower half of the style thin, hairy; upper or swollen half and the stigma glabrous: legume oblong, 2-seeded, pointed with the long straight base of the style.

764. (2) D. *glutinosus* (Roxb.:) annual, twining, covered all over, but particularly the young parts, with glutinous somewhat harsh short hairs: leaflets roundish-ovate, acuminated, the terminal one rhomboid and sometimes slightly 3-lobed: stipules sessile, ovate, spreading; partial stipules caducous or wanting: racemes peduncled, longer than the leaves, straight, many-flowered; flowers alternate, usually solitary: vexillum sprinkled with glutinous pubescence: legume hairy, oblong-lanceolate, pointed with the long base of the style, 2-seeded.—*Roxb.! hort. Bengh. p.* 55; *fl. Ind.* 3. *p.* 312; *in E. I. C. mus. tab.* 290: *Wall.! L. n.* 5560; *Wight! cat. n.* 834.—Hedysarum glutinosum, *herb. Madr.!*—Glycine viscosa, *Roth, nov. sp. p.* 349.—Rhynchosia viscosa, *DC. prod.* 2. *p.* 387.

Roxburgh describes and figures subulate partial stipules; if ever present, they must be very caducous, as there is not a trace of them on any of the specimens before us. The vexillum is yellow on both sides, striated on the outer with darker coloured veins.

765. (3) D. *tomentosus* (Roth:) twining, covered all over with scarcely-glutinous very soft pubescence or short villi: leaflets roundish-ovate, acuminated, the terminal one broadly rhomboid: stipules sessile, oblong-lanceolate; partial ones somewhat persistent, setaceous: racemes peduncled, elongated, much longer than the leaves, many-flowered: flowers alternate, usually solitary: vexillum densely clothed with adpressed silky hairs: legume oblong, somewhat scimitar-shaped, softly hairy, 2-seeded, pointed with the long straight base of the style.—*Roth, nov. sp. p.* 345; *DC. prod.* 2. *p.* 401; *Spr. syst.* 3. *p.* 251; *Wight! cat. n.* 1152.

Perhaps too closely allied to *D. glutinosus;* but the pubescence appears quite different: the vexillum in the dried plant is dark purple on the inside. Roth's description agrees in every point except the erect stem, a character which he might have inferred from imperfect specimens.

2. Veræ. *Leaflets with partial stipules: calyx bibracteolate at the base.*

a. Calyx deeply bilabiate; segments subulate: vexillum about a half longer than the keel, not spurred at the base of the limb; callosities long, narrow, half the length of the vexillum: alæ cohering with the keel at the base: style subulate, glabrous: stigma large, capitate, glabrous: legume compressed.—*Macrotyloma.*

766. (4) *D. uniflorus* (Lam.:) annual: stem erect; branches twining, young shoots and leaves covered with long soft silky hairs: leaflets ovate, when old pubescent: stipules oblong: flowers axillary, 1–3 together, sometimes on a very short common peduncle: calyx villous; segments long, subulate, upper lip split at the apex: vexillum obovate-oblong; keel straight-falcate: legume compressed, linear, falcate, pointed with the long base of the style, softly hairy, about 6-seeded.—*Lam. enc. meth.* 2. *p.* 299; *DC. prod.* 2. *p.* 398; *Wall.! L. n.* 5538; *Wight! cat. n.* 741.—D. biflorus, *Roxb. fl. Ind.* 3. *p.* 313 (not *Lour.*)—D. Woolawa, *Roxb. in E. I. C. mus. tab.* 283.—*Pluk. t.* 213. *f.* 4.

D. biflorus seems to have been taken up by Linnæus from a bad description made by Royen from a cultivated plant: that it is the same as the present species is very probable, but Linnæus himself did not refer to the above figure of Plukenet although both Willdenow and De Candolle do so. Judging from Linnæus' short character of his *D. pubescens,* it appears also to be the same with ours, but we hesitate in consequence of its being said, perhaps erroneously, to be a native of South America.—Roxburgh states that it is much cultivated all over the Coromandel coast, but that he never saw it in a wild state.

Digitized by Google

767. (5) D. *ciliatus* (herb. Madr.!:) root perennial, tuberous: stems twining, and with the petioles and racemes pubescent or slightly hairy: leaflets from oval to ovate, obtuse or sometimes acute, mucronate, when adult glabrous except the nerves underneath sprinkled with hairs; margin densely ciliated with much short silvery hair: stipules oblong, bracteas and bracteoles sessile, oblong-lanceolate, all of them rigid and elegantly striped longitudinally with white and purplish striæ: racemes axillary, much shorter than the petiole, few- (about 4-) flowered: calyx segments long, keeled, subulate and somewhat rigid towards their apex; upper lip split: vexillum obovate: keel much falcate: legume compressed, straightish scimitar-shaped, pointed, glabrous, 2–4-seeded.—*Klein! in Willd. sp. p.* 1049; *DC. prod.* 2. *p.* 398; *Spr. syst.* 3. *p.* 249; *Wall.! L. n.* 5558; *Wight! cat. n.* 740.—D. prostratus, *Koen. in herb. Banks*; *Roxb. fl. Ind.* 3. *p.* 310.—D. argenteus, *Roxb. in E. I. C. mus. tab.* 288.——Circars. Courtallum.

Roxburgh mentions that the leaflets when young are silky on the under side, but none of our specimens show any tendency towards this, nor is it represented in his own drawing.

b. Calyx scarcely bilabiate, campanulate, 5-toothed; the two upper teeth partially united, the lowest the longest: legume compressed.—*Eudolichos.*

768. (6) D. *falcatus* (herb. Madr.!:) root perennial, tuberous: stems twining: leaflets somewhat roundish ovate, acuminated; the terminal one more or less 3-lobed: stipules oblong, pointed, sessile, reflexed: peduncles slender, about the length of the petioles, 2–8-flowered at the apex: petals equal in length; vexillum broadly ovate, shortly 2-spurred at the base, with two long callosities extending half-way up the limb compressed and projecting inwards at the apex; keel much falcate: ovary surrounded by a short sheath at the base: tumid part of the style sessile, glabrous; stigma capitate, woolly: legume linear, falcate, glabrous, compressed, 4–8-seeded; valves flat.—D. trilobatus, *Wall. L. n.* 5541.—α; stems glabrous or slightly hairy; leaflets glabrous or slightly pubescent.—*Wight! cat. n.* 743.—D. falcatus, *Klein! in Willd. sp.* 3. *p.* 1047; *DC. prod.* 2. *p.* 398; *Spr. syst.* 3. *p.* 249; *Roxb. fl. Ind.* 3. *p.* 311.—D. tuberosus, *Roxb. in E. I. C. mus. tab.* 289 (excl. syn. *Lour.* and *Pluk.*)—β; stems and leaflets hairy.—*Wight! cat. n.* 742.

The more hairy states of this plant are found in the drier and warmer situations; the more glabrous towards the north of the Peninsula.

769. (7) D. *subcarnosus* (W. & A.:) glabrous, twining: leaflets broadly ovate, slightly acuminated, mucronulate, somewhat fleshy; terminal one deltoid: stipules sessile, ovate, striated: racemes few-flowered, on peduncles many times longer than the leaves: legumes long-linear, narrow (2–4 inches long and scarcely 1½ line broad), straight, pointed with the slightly recurved subulate persistent base of the style, glabrous, many-seeded, not torulose, slightly compressed; valves a little convex.—*Wight! cat. n.* 737.

Of this species we have not seen the flowers, but we have little doubt about its being of the present genus: the pod is neither flat as in the species we have already described, nor terete as in those which follow, but between the two. It was sent by Dr Wight's collectors under the native name of Catthatan-payarroo, but it cannot be any variety of *D. Catjang* of Linnæus.

c. Calyx campanulate, 5-toothed; the two upper teeth partially united, the lowest the longest: legume terete, subulate-pointed.—*Catjang*, DC.

770. (8) D. *pilosus* (Roxb.!:) perennial, twining, softly hairy or pubescent: leaflets ovate-lanceolate: stipules sessile, lanceolate: racemes short, axillary, short-peduncled, several-flowered; bracteoles minute: also about half the length of the other petals, angled, with a spur or horn at the base on the one side and another on the other side near the apex; vexillum broadly obovate: upper part of the style glabrous: stigma bearded: legume long

Digitized by Google

(4–5 inches), straight, cylindric, pointed, very hairy, 8–12-seeded, much intercepted between the seeds.—*Roxb.! fl. Ind.* 3. *p.* 312; *in E. I. C. mus. tab.* 291; *Klein! in Willd. sp.* 3. *p.* 1043; *DC. prod.* 2. *p.* 397; *Spr. syst.* 3. *p.* 249; *Wight! cat. n.* 739.—Phaseolus difformis, *Wall.! L. n.* 5599.——Circars. Travancore.

d. Calyx campanulate, 5-toothed; the two upper teeth partially united; the lowest longer than the others: legume terete, unguiculate (ending in a transversely compressed beak, concave on the under side).—*Unguicularia*, DC.

771. (9) D. *Sinensis* (Linn.:) annual, twining, glabrous, upper parts often slightly scabrous: leaflets ovate or oblong, acuminated: stipules oblong-lanceolate, attached below the middle and free at the base: peduncles longer than the leaves; flowers in an oblong head or short raceme: upper part of the style bearded along the one side: legume nearly straight, cylindric, torulose, with a more or less recurved unguiculate beak, glabrous, 6–12-seeded: seeds somewhat cylindric, truncated at both ends.—*Wall. L. n.* 5550.—D. Catjang, *Wall.! L. n.* 5549.—*α*; leaflets ovate-acuminated: peduncles often many-flowered; legumes pendulous, long.—D. Sinensis, *Willd. sp.* 3. *p.* 1038; *DC. prod.* 2. *p.* 399; *Spr. syst.* 3. *p.* 249; *Roxb. fl. Ind.* 3. *p.* 302; *in E. I. C. mus. tab.* 279.—*Rumph. Amb.* 5. *t.* 134 (bad).—*β*; leaflets oblong, acuminated, angled or somewhat hastate at the base: peduncles few-flowered: legumes erect.—*Wight! cat. n.* 738.—D. Tranquebaricus, *Jacq. hort. Vind.* 3. *t.* 70; *herb. Madr.!*; *DC. prod.* 2. *p.* 400; *Spr. syst.* 3. *p.* 249.—D. Catjang, *Roxb. fl. Ind.* 3. *p.* 303 (not *Linn.*)—*Rheed. Mal.* 8. *t.* 41 ?

We cannot distinguish these varieties except as more or less luxuriant states of the same plant: Roxburgh refers the *D. Tranquebaricus*, raised in Bengal from seed sent by the missionaries, to his *D. Sinensis* (our *α*), while the dried specimens we have of the same plant, obtained from Klein's herbarium, belong to our *β*, probably from being grown in a drier and less fertile soil: Rheede's figure above quoted has the leaves of our *α*, but the erect and shorter legumes of our *β*. *D. Catjang* of Linnæus, according to his description and the figure in Rumphius, is a very different species from either.

XLVI. LABLAB. *Adans.*; *Moench.*—Dolichos. *Gært. fr.* 2. *t.* 150.

Calyx bibracteolate, campanulate-tubular, 4-cleft; the three lower segments acute, the upper broad. Corolla papilionaceous: vexillum patent, channelled at the base, with 4 callosities, the upper pair prominent: keel falcate, bent in at a right angle. Stamens diadelphous, the tenth received within the callosities of the vexillum. Ovary with a short tubular sheath at its base. Style compressed, upper part bearded on the under side. Stigma a truncated glabrous gland, terminal. Legume compressed or flat, tubercled or muricated along both sutures, about 4-seeded, with cellular partitions between the seeds. Seeds ovate, somewhat compressed; hilum long, linear, extending from the podosperm nearly half round the seed.—Twining, herbaceous or perennial, glabrous or slightly pubescent plants. Stipules spreading. Leaves pinnately trifoliolate; leaflets entire, furnished with partial stipules. Racemes axillary, elongated, peduncled, usually bearing a leaf near its base: pedicels short, aggregated on alternate glandular knobs. Bracteoles broadly oval, about as long as the calyx.

772. (1) L. *vulgaris* (Savi:) legumes broadly scimitar-shaped, gibbous below the apex, and ending abruptly in a straight or recurved cuspidate point: seeds longitudinally oval.—*DC. prod.* 2. *p.* 401: *Wall.! L. n.* 5537; *Wight! in Hook. bot. misc.* 2. *p.* 352. *suppl. t.* 15; *cat. n.* 745, 746, 747.—L. lignosus, *Wall.! L. n.* 5537. *b.*—L. Nankinicus, *Savi*; *DC. l. c. p.* 402.—L. leucocar-

Digitized by Google

pus, *Savi; DC. l. c.*—L. microcarpus, *DC. l. c.*—L. perennans, *DC. l. c.*—Dolichos Lablab, *Linn.; Spr. syst.* 3. *p.* 249; *Roxb. fl. Ind.* 3. *p.* 305.—D. spicatus, *Koen.; Roxb. in E. I. C. mus. tab.* 282.—D. albus, *Lour.; Spr. l. c. p.* 250.—D. Benghalensis, *Jacq. hort. Vind.* 2. *t.* 124; *Spr. l. c. p.* 249.—D. purpureus, *Jacq. frag. p.* 45. *t.* 55; *Spr. l. c. p.* 250.—D. tetraspermus, *Willd. sp.* 3. *p.* 1044; *DC. l. c. p.* 397; *Spr. l. c.*—D. cuspidatus, *Grah.! in Wall.! L. n.* 5566.—*Rumph. Amb.* 5. *t.* 136, 137, 141. *f.* 1.

So various are the forms of the legume, and the colour of the seed, that we agree with Roxburgh in bringing together many of the supposed species of authors. The characters proposed by Savi, and adopted by De Candolle, are derived from the few permanent varieties known in Europe.

773. (2) L. *cultratus* (DC.:) legumes oblong-linear, falcate and recurved at a right angle towards the apex, with a subulate point; seeds transversely oval.—*DC. prod.* 2. *p.* 402; *Wight! cat. n.* 744.—L. lignosus, *Graham! in Wall.! L. n.* 5538 (partly).—Dolichos cultratus, *Thunb.; Spr. syst.* 3. *p.* 249.—D. ensiformis, *Tunb.*—D. lignosus, *Roxb. fl. Ind.* 3. *p.* 307 (not *Linn.*).—D. Lablab, *Roxb. in. E. I. C. mus. tab.* 281.

Roxburgh enumerates six varieties. Our specimens of *Dol. lignosus*, obtained from the botanical garden of Edinburgh, and precisely agreeing with the figure in the bot. mag. t. 382, as well as with the Linnæan description, is a very different plant, and apparently a true *Dolichos*, although we have not seen the fruit or seed: the flowers form a sort of umbel or very short lax raceme at the apex of the peduncle; they are solitary and do not spring out of glandular knobs.

XLVII. PACHYRRHIZUS. *Rich.*—Cacara, *Pet. Th.*

Calyx with 2 caducous bracteoles, urceolate, 4-lobed, the upper lobe broad and emarginate. Corolla papilionaceous: vexillum roundish, spreading, without callosities, at the base with two plaits enclosing the claws of the wings: alæ semilunate, with a long filiform spur. Stamens diadelphous (9 and 1), alternately shorter. Ovary with a crenulate ring round its base. Upper part of the style glabrous, spirally incurved. Stigma large. Legume linear, compressed, straight, contracted between the seeds. Seeds 7–12, orbicular, compressed: hilum small.—Root a turnip-like tuber, often very large, eatable. Stems somewhat perennial, twining. Leaves pinnately-trifoliolate: leaflets with partial stipules. Racemes axillary, often very long. Flowers fascicled on large glandular knobs, violet-blue.

*774. (1) P. *angulatus* (Rich.:) young parts with reflexed soft hairs: leaflets angled-toothed, glabrous or villous; lateral ones triangular; terminal reniform-rhomboid, acuminated: stipules large, ensiform: racemes very long: legume sprinkled with short hairs.—*DC. prod.* 2. *p.* 402; *Spr. syst. suppl. p.* 281; *Wall.! L. n.* 5526.—Dolichos bulbosus, *Linn. sp. p.* 1020; *Roxb. fl. Ind.* 3. *p.* 309; *in E. I. C. mus. tab.* 1606.—Stizolobium bulbosum, *Spr. syst.* 3. *p.* 252.—*Rumph. Amb.* 5. *t.* 132; *Pluk. t.* 52. *f.* 4.

Roxburgh conjectures this may have come originally from America.

XLVIII? PAROCHETUS. *Ham.*

Calyx ebracteolate, campanulate, 4-cleft; segments equally broad, the lowest one longer than the others. Corolla longer than the calyx, papilionaceous: vexillum incumbent, broadly obovate, emarginate, longer than the other petals: keel obtuse, covered by the alæ. Stamens diadelphous (9 and 1). Style glabrous. Stigma obtuse. "Legume gibbous, many-seeded. Seeds roundish."—Herbaceous perennial creeping plants. Petioles long, erect. Leaves

Digitized by Google

several times shorter than the petioles, palmately-trifoliolate. Stipules membranaceous. Peduncles axillary, solitary, erect, about as long as the petioles, bibracteolate about the middle, 1-flowered. Flowers purplish.

We have not seen the fruit or the seed; we leave it therefore where placed by De Candolle, and on the supposition that by *semina subrotunda* Don means *somewhat globose*. The digitately trifoliolate leaves, however, and the creeping stems, appear to remove it far from *Dolichos*.

775. (1) P. *major* (Don:) leaflets obovate, retuse, crenulated.—*Don, prod. fl. Nep. p.* 241; *DC. prod.* 2. *p.* 403; *Spr. syst. suppl. p.* 279 (char. bad); *Wall. L. n.* 5525; *Wight! cat. n.* 723.——Neelgherries.

We have seen neither Don's nor Wallich's specimens, so that our species from the Peninsula may be distinct from that from Nepal. In ours the leaflets are glabrous on the upper side, strigosely pubescent on the under: the petioles, peduncles, and calyx are sprinkled with a few soft spreading hairs: the habit is quite that of an *Oxalis*.

XLIX. PSOPHOCARPUS. *Neck.*—Botor. *Adans.*

Calyx with 2 oval bracteoles at its base, urceolate, somewhat unequally bilabiate: upper lip rather the largest, 2-lobed, lower 3-partite: the four upper segments oval, the lowest narrower and longer than the others; all obtuse. Corolla papilionaceous: vexillum roundish, reflexed, without callosities; the margins of the spurs and claw inflexed: alæ oblong, with a spur near the base; the spur attached by its middle, and parallel to the alæ, the one segment pointing downwards, the other upwards: keel-petals distinct at the base. Stamens diadelphous (9 and 1). Ovary with a very short crenulate ring round its base. Style glabrous. Stigma large, woolly. Legume oblong, with 4 longitudinal membranaceous angles or wings, 7-8-seeded. Seeds roundish.—Root tuberous, annual. Stems twining, glabrous. Leaves pinnately trifoliolate: leaflets ovate-lanceolate, acuminated, glabrous. Stipules semisagittate. Peduncles about the length of the petioles, bearing a few flowers about their apex.

*776. (1) P. *tetragonolobus* (DC.)—*DC. prod.* 2. *p.* 403; *Wall.! L. n.* 5540 (*p.* 204); *Wight! cat. n.* 734.—Dolichos tetragonolobus, *Linn.; Spr. syst.* 3. *p.* 249.—D. ovatus, *Grah. in Wall. L. n.* 5540 (*p.* 191).—*Rumph. Amb. 5. t.* 133.

L. CANAVALIA. *Adans.; DC.*

Calyx with two roundish very caducous bracteoles at its base, tubular, unequally bilabiate: upper lip much the largest, of two large rounded lobes; lower small, acutely 3-toothed. Corolla papilionaceous; vexillum roundish, with two large callosities near the base of the limb: alæ linear, oblong, auricled and repand on the upper margin: keel falcate at a right angle, its petals distinct from the base to the angle. Stamens 10, monadelphous. Ovary surrounded at the base with a small crenulated cup. Stigma large, oblique, glabrous. Legume compressed, 3-keeled on the upper suture, mucronate, with cellular membranes surrounding and separating the seeds. Seeds ovaloblong: hilum linear, extending along the one margin of the seed.—Herbaceous or suffrutescent plants. Branches twining. Leaves pinnately trifoliolate. Stipules small, wart-like: partial stipules setaceous, often caducous. Racemes axillary, clongated, many-flowered. Flowers in pairs or threes on glandular knobs, large, purplish.

Digitized by Google

Roxburgh in his drawings, and De Candolle, make the stamens sometimes diadelphous: we have not yet found them so in any one instance.

777. (1) C. *gladiata* (DC.:) perennial, twining, glabrous: leaflets cordate-ovate, rather acute: legumes 5–10 times (or more) longer than broad.—*DC. prod.* 2. *p.* 404 (α); *Wall.! L. n.* 5531 (partly); *Wight! cat. n.* 736. *bis.*—Dolichos gladiatus, *Jacq. ic. rar.* 3. *t.* 560; *Willd. sp.* 3. *p.* 1039; *Spr. syst.* 3. *p.* 249; *Roxb. fl. Ind.* 3. *p.* 300.—D. ensiformis, *Lour.* (partly); *Roxb. in E. I. C. mus. tab.* 278 (not? *Linn.*)—*Rheed. Mal.* 8. *t.* 44 (good); *Rumph. Amb.* 5. *t.* 135. *f.* 1.

The Linnæan *D. ensiformis* is a Jamaica plant, figured by Sloane (Jam. 1. t. 114. f. 1, 2, 3), and although that figure be pronounced by Roxburgh a good representation of the East Indian plant, we hesitate about uniting them: we have not, however, seen specimens from Jamaica.

778. (2) C. *virosa* (W. & A.:) biennial, twining, glabrous or with the racemes pubescent: leaflets oval or ovate; legumes linear scimitar-shaped, 4–8-seeded.—*Wight! cat. n.* 736.—C. gladiata β, *DC. prod.* 2. *p.* 404; *Wall. L. n.* 5531 (partly).—Dolichos virosus, *Roxb. fl. Ind.* 3. *p.* 301.—D. ensiformis, *Lour.* (partly).—*Rheed. Mal.* 8. *t.* 45.

We have referred to n. 736. of Wight's catalogue from the shape of the leaves alone; they are rounded, and not the least cordate at the base; they are, however, more acute both in our specimen and in Rheede's figure than according to Roxburgh, who describes them "oval, scarcely pointed."

779. (3) C. *mollis* (Wall.:) twining; stems slightly, branches densely pubescent: leaflets ovate, young ones tomentose, older ones shortly villous: legumes oblong-linear, few-seeded.—*Wall.! L. n.* 5533; *Wight! cat. n.* 735.—Neelgherries. Dindygul hills.

780. (4) C. *obtusifolia* (DC.:) biennial, twining, glabrous: leaflets roundish-obovate: legumes semi-oval, straight, about twice as long as broad, 3–6-seeded.—*DC. prod.* 2. *p.* 404; *Wall. ! L. n.* 5532; *Wight! cat. n.* 748.—Dolichos obtusifolius, *Lam. enc. meth.* 2. *p.* 295.—D. rotundifolius, *Vahl, symb.* 2. *p.* 81; *Spr. syst.* 3. *p.* 251; *Roxb. fl. Ind.* 3. *p.* 302.—*Rheed. Mal.* 8. *t.* 43; *Pluk. t.* 51. *f.* 2.——Sands along the sea coast of Coromandel and Malabar; at the mouth of the Godavery in the north, and between Quilon and Anjengo in Travancore on the south.

LI. MUCUNA. *Adans.*—Hornera, *Neck.*—Stizolobium, *Pers.*—Negretia, *R. & P.*—Citta, *Lour.*—Carpopogon, *Roxb.*

Calyx with 2 very caducous bracteoles as long as the tube, campanulate, bilabiate: upper lip broad, entire or emarginate: lower trifid, the middle segment the longest. Corolla papilionaceous: vexillum cordate, incumbent on the alæ, much shorter than them and the keel, without callosities: alæ oblong-linear, connivent, sometimes slightly cohering together by their spurs between the vexillum and keel: keel straight below, slightly falcate in the upper part, terminated by a smooth polished acute beak. Stamens diadelphous (9 and 1), alternately longer: anthers alternately oblong and ovate. Style long and slender; its lower part hairy, upper glabrous. Stigma small. Legume linear, oblong, or roundish, few- (1–8-) seeded, with partitions between the seeds, polished within. Seeds oval, roundish, or reniform, with a narrow oblong or linear hilum.—Twining plants. Leaves pinnately trifoliolate; leaflets with partial stipules. Racemes elongated or short and umbel-like, often pendulous when in fruit. Legumes usually densely clothed with rigid brittle sharp hairs.

Digitized by Google

§ 1. *Legumes roundish or oblong, 1–3-seeded, deeply furrowed along the sutures; the valves furnished with oblique lamellæ or plaits that anastomose and form long cells on the surface.*—Citta, *Lour.*

781. (1) M. *monosperma* (DC.:) perennial: leaflets ovate, when young pubescent, adult ones nearly glabrous: racemes short, somewhat corymbiform, short-peduncled, drooping: pedicels long: lowest calyx-segments longish pointed; the others very short and inconspicuous: legume semi-oval, obliquely plaited, 1-seeded, armed with very stiff stinging hairs: seed reniform; the hilum entirely surrounding the convex margin.—*DC. prod.* 2. *p.* 406 (without char.); *Wall. L. n.* 5623; *Wight! in Hook. Bot. misc.* 2. *p.* 346. *Suppl. t.* 12; *cat. n.* 752.—Carpopogon monospermum, *Roxb. fl. Ind.* 3. *p.* 283. —Dolichos urens, *Roxb. in E. I. C. mus. tab.* 286.

782. (2) M. *atropurpurea* (DC.:) perennial: leaflets ovate, acuminated, adult ones nearly glabrous: racemes drooping, long-peduncled, sometimes compound; the floriferous portion sometimes elongated; pedicels long, slender, compressed: calyx-segments all broadly ovate, obtuse: legume oblong-oval, obliquely plaited, 2- (or sometimes 1-) seeded, copiously armed with brown stinging hairs: seed oval, more convex on the one side, and there furnished its whole length with the linear hilum.— *DC. prod.* 2. *p.* 406 (without char.); *Wall.! L. n.* 5620; *Wight! cat. n.* 751.—Carpopogon atropurpureum, *Roxb.! fl. Ind.* 3. *p.* 287.——Courtallum. Travancore.

It is difficult to explain in words the nature of the plaits on the legume: in the present species there are (always?) four series of them, proceeding from the apex of the fruit; each of these takes a diagonal direction from right to left, for about half the breadth of the pod; it then makes a turn and proceeds upwards, parallel to and at no great distance from the former plait, and after having thus reached close to the starting point, it bends its course again obliquely downwards: the whole plaits from the apex to the base of the legume are formed in this way; so that each valve might be described as covered with only two long obliquely anfractuose lamellæ. In *M. monosperma* the arrangement is not quite so regular or conspicuous in our specimens, but we have no doubt of its being similar.

§ 2. *Legumes oblong, deeply furrowed along the sutures: valves even (without plaits).*—Carpopogon.

783. (3) M. *gigantea* (DC.:) perennial: leaflets ovate, acute, adult ones glabrous: flowers almost umbellate, at the apex of long pendulous peduncles: pedicels long, slender: three lower calyx-segments short, tooth-like; the others very short and inconspicuous: legume linear-oblong, tapering at the base into a short stalk, deeply furrowed along the sutures, not plaited, armed with stiff brown stinging hairs, 3–6-seeded: seeds oval, surrounded on the more convex margin with the long linear hilum.—*DC. prod.* 2. *p.* 405 (α); *Wall.? L. n.* 5619; *Wight! in Hook. Bot. misc.* 2. *p.* 357. *Suppl. t.* 14; *cat. n.* 753.—Dolichos giganteus, *Willd. sp.* 3. *p.* 1041; *Spr. syst.* 3. *p.* 250.— Carpopogon giganteum, *Roxb. fl. Ind.* 3. *p.* 286.—Stizolobium giganteum, *Spr. syst. suppl. p.* 281.—*Rheed. Mal.* 8. *t.* 36.——Negapatam. Malabar.

§ 3. *Legumes linear, not sulcated on the sutures: valves without plaits.*— Stizolobium, *Browne.*

784. (4) M. *hirsuta* (W. & A.:) branches, petioles, racemes and under side of the leaflets hirsutely tomentose: leaflets ovate, upper side hirsutely pubescent: racemes drooping, long-peduncled; floriferous part somewhat long; pedicels as short as the calyx; calyx-segments broadly lanceolate,

Digitized by Google

acuminated, the length of the tube: legume linear, curved, very densely covered with rigid stinging brittle hairs: hilum linear.—*Wight! cat. n.* 750.

785. (5) M. *prurita* (Hook.:) annual: branches pubescent or only slightly hairy: leaflets ovate; upper side glabrous, under sprinkled with adpressed silvery hairs: racemes shorter than the leaves, peduncled, drooping: pedicels shorter than the calyx: calyx cleft to the middle, white with adpressed hairs; segments broad-lanceolate: legume slightly curved like an S, densely clothed with rigid stinging hairs, about 6-seeded; valves not keeled longitudinally along the middle: hilum linear.—*Hook. bot. misc.* 2. *p.* 348.—M. pruriens, *Wall. L. n.* 5616; *Wight! in Hook. bot. misc.* 2. *suppl. t.* 13; *cat. n.* 755.—Dolichos pruriens, *Roxb. in E. I. C. mus. tab.* 284.—Carpopogon pruriens, *Roxb. fl. Ind.* 3. *p.* 283.—Stizolobium pruriens, *Spr.? syst.* 3. *p.* 252.—*Rheed. Mal.* 8. *t.* 35; *Rumph. Amb.* 5. *t.* 142.

* 786. (6) M. *capitata* (DC.:) annual: young shoots slightly pubescent: leaflets ovate, acute or obtuse, mucronate; upper side nearly glabrous, under sprinkled with adpressed silvery hairs: peduncles axillary, very short, bearing several umbellate flowers at its apex: calyx cleft to the middle, white from adpressed hairs; segments lanceolate, acuminated: legume nearly cylindrical, slightly curved, densely and rather softly pubescent, 5–6-seeded; valves irregularly wrinkled longitudinally: seeds oval; hilum linear-oblong, rather short (not extending one-fourth round the seed).—*DC. prod.* 2. *p.* 406 (without char.); *Wight! cat. n.* 754.—Dolichos Soorootoo, *Roxb. in E. I. C. mus. tab.* 285.—*Rumph. Amb.* 5. *t.* 138?.

Roxburgh only knew this in a state of cultivation: our specimens are from Klein's herbarium, marked "*Dol. pruriens,*" and obtained from the Missionaries' Garden. *M. niveum*, DC. (*Carpopogon niveum*, Roxb. in E. I. C. mus. tab. 1601), is a species very closely allied, but differs by the long drooping racemes, and the legumes, when ripe, entirely free from pubescence: it likewise is only known as a cultivated plant.

LII. CANTHAROSPERMUM. *W. & A.*

Calyx ebracteolate, 4-cleft; segments nearly equal; upper broader than the others, split at the apex. Corolla papilionaceous, longer than the calyx, deciduous: petals all about the same length: vexillum recurved or reflexed, oblong-obovate, without callosities at the base: keel falcate. Stamens diadelphous (9 and 1), the tube somewhat persistent. Ovary 4–8-seeded: upper part of the style and stigma glabrous. Legume oblong-linear, compressed, 3–8-seeded, transversely constricted between the seeds externally, and with slight coriaceous dissepiments between them internally. Seeds oblong, transverse, with a large fleshy bifid carunculus at the hilum.—Twining plants. Leaves pinnately trifoliolate: leaflets soft and more or less velvetty on both sides. Stipules caducous: partial ones bristle-like, inconspicuous. Peduncles axillary, several flowered.

The habit of this genus is that of *Rhynchosia*, but the somewhat persistent stamen-tube and the legume approach it to the *Hedysareæ*: the partitions of the latter are not merely cellular, as in many of the *Phaseolæ*, but hard, and of the same texture with the legume itself, and are formed by the opposite valves being so constricted as to meet: the legume however splits when ripe, as in the *Phaseoleæ*. Our generic name is taken from the specific appellation given to the species known to Linnæus.

787. (1) C. *pauciflorum* (W. & A.:) biennial: leaflets obovate, slightly rugose and paler on the under side: peduncles shorter than the petiole, few-(often 2-) flowered: calyx about half the length of the corolla, cleft to the middle; segments lanceolate-acuminated, slightly curved upwards: vexillum recurved: legume linear, velvetty or hairy.—*Wight! cat. n.* 758.—Cajanus

Digitized by Google

scarabæoides, *Pet. Th.*; *Graham! in Wall.! L. n.* 5580.—Dolichos scarabæoides, *Linn. sp. p.* 1020; *Roxb. fl. Ind.* 3. *p.* 315 (as to the syn., excl. char. and descr.)—D. medicagineus, *Roxb. l. c.* (as to descr. and char., excl. syn.)—D. minutus, *Roxb. in E. I. C. mus. tab.* 252. *f.* 1.—Rhynchosia? scarabæoides, *DC. prod.* 2. *p.* 387.—R. biflora, *DC.? l. c.*—Stizolobium scarabæoides, *Spr. syst.* 3. *p.* 253.—*Pluk. t.* 52. *f.* 3.

By comparing our synonyms with those of *Rhynchosia medicaginea*, it will be seen that Roxburgh had unaccountably reversed the descriptions of the two, although from his references to plates he obviously knew both species well. What De Candolle received for *Dol. scarabæoides*, Roxb., and of which he has made his *Rhynch. biflora*, we scarcely know: we have referred it here on account of the partitions between the seeds, but we have very rarely, almost never, found the seeds reduced so few as two even by abortion.—Our Peninsular specimens have the legumes velvetty: but we have others from Ceylon in which they are clothed with longish somewhat adpressed fulvous hairs. Linnæus appears to have taken his description of the seed from the figure of a small beetle placed by Plukenet alongside of the seed as a contrast.

788. (2) C. *albicans* (W. & A.:) leaflets roundish, ovate or obovate, mucronate, whitish on the under side: racemes few-flowered, lax, as long or longer than the leaves: calyx 4–5 times shorter than the corolla; segments ovate, shorter than the tube, straightish: vexillum reflexed: legume oblong-linear, velvetty, *Wight! cat. n.* 759.—Cajanus? albicans, *Graham! in Wall.! L. n.* 5582.—C.? Wightii, *Graham! l. c. n.* 5583.—C.? niveus, *Grah.! l. c. n.* 5581.——Dindygul hills at an elevation of 2500 feet.

Owing to the short calyx, scarcely longer than the claws of the petals, this species has the vexillum as much reflexed as in *Kennedya*.

LIII. CAJANUS. *DC.*

Calyx ebracteolate, campanulate, somewhat bilabiate; lips nearly equally long; upper shortly bifid; lower 3-partite, the segments lanceolate-subulate, slightly curved upwards, middle one a little longer than the others; apices of all recurved. Corolla papilionaceous, deciduous; petals of the same length: vexillum broad, with two large callosities at the base of the limb; the margins of the spurs and claw inflexed: keel falcate. Stamens diadelphous (9 and 1), alternately shorter: tube deciduous. Ovary 4–5-ovuled. Style ascending, lower part slender, hairy; upper glabrous. Stigma slightly peltate. Legume linear-lanceolate, tapering at both ends, compressed, torulose, deeply and obliquely! constricted between the seeds, 3–5-seeded with membranaceous partitions between them. Seeds roundish, scarcely compressed; hilum oblong; carunculus inconspicuous.—Erect shrubs, softly pubescent or velvetty. Leaves pinnately trifoliolate; leaves oval-lanceolate, mucronate. Stipules lanceolate; partial ones short-subulate. Racemes axillary, pedunculed corymbiform; with caducous oblong-lanceolate bracteas: pedicels slender, in pairs. Legume hirsutely pubescent.

789. (1) C. *Indicus* (Spr.)—*Spr. syst.* 3. *p.* 248; *Wight! cat. n.* 764.—C. bicolor, *Wall.! L. n.* 5577.—*Pluk. t.* 231. *f.* 3.—*α*; vexillum of an uniform yellow colour on both sides.—C. flavus, *DC. prod.* 1. *p.* 406.—Cytisus, n. 279, *Linn.! in herb. Herm.*; *fl. Zeyl.*—C. Cajan, *Linn. sp. p.* 1041; *Roxb. fl. Ind.* 3. *p.* 325; *in E. I. C. mus. tab.* 293.—*β*; vexillum purplish and veined on the outside, yellow on the inside.—C. bicolor, *DC. l. c.*—Cytisus pseudo-Cajan, *Jacq. hort. Vind.* 2. *t.* 119.—*Rheed. Mal.* 6. *t.* 13.

These two varieties differ by the colour of the vexillum alone, as has been already remarked by Sprengel: the other characters given are entirely ima-

Digitized by Google

ginary; at least they neither bear any relation to the colour of the flowers, nor are constant on the same individual. Sprengel has added two other species, but they belong to different genera.

LIV. ATYLOSIA, *W. & A.*—Collæa, *DC.* (partly).

Calyx ebracteolate, campanulate, deeply bilabiate; upper lip very shortly split at the apex; lower 3-partite, the middle segment longer than the lateral ones, and slightly longer than the upper lip. Corolla papilionaceous, at length scariose, persistent: vexillum broad, recurved, a little longer than the other petals, without callosities: keel slightly falcate, obtuse. Stamens diadelphous (9 and 1), alternately a little shorter: anthers uniform. Ovary about 4-ovuled. Lower part of the style slender, hairy; upper part glabrous. Stigma slightly capitate. Legume oblong-linear, compressed, about 4-seeded, slightly constricted externally, and with cellular partitions internally between the seeds. Seeds roundish: hilum oval, with a large fleshy carunculus.—Erect or diffuse shrubby plants. Branches villous or tomentose. Leaves palmately trifoliolate: leaflets 3-nerved at the base. Partial stipules wanting. Peduncles axillary, or forming a kind of raceme along the young almost leafless terminal shoots, generally 2-flowered, rarely wanting and with two axillary pedicels. Legume villous or tomentose.

This genus we have been induced to separate from the last principally on account of the persistent corolla, the absence of callosities on the vexillum, the large carunculus to the seed as in *Cantharospermum*, and the foliage.

790. (1) A. *Candollii* (W. & A.:) erect: branches straight, twiggy; young parts villous with fulvous hairs: leaflets oval; upper side even, pubescent; under reticulated, shortly tomentose, villous on the nerves and margin: stipules lanceolate, acuminated, spreading: peduncles 2-flowered, longish: calyx villous; segments lanceolate-acuminated, curved upwards, lowest one about half the length of the keel: spurs of the vexillum introflexed, slightly callous: legumes villous.—*Wight! cat. n.* 763.—Collæa trinervia. *DC. mem. leg. p.* 247. *t.* 41; *prod.* 2. *p.* 240.—Odonia trinervia, *Spr. syst. suppl. p.* 279.—Rhynchosia Wightiana, *Grah.! in Wall.! L. n.* 5500.——Neelgherries.

In our specimens from the Neelgherries, the leaflets are obtuse as in De Candolle's figure and description; but others from Ceylon are more robust, with the habit and leaves of the next species: the two, however, are, we think, distinct.

791. (2) A. *major* (W. & A.:) erect: branches straight, twiggy; young parts villous with fulvous hairs: leaflets oval, slightly acute at both ends; upper side even, pubescent; under reticulated, shortly tomentose, villous on the nerves and margin: stipules lanceolate, subulate, spreading: peduncles 2-flowered, longish: calyx villous; segments subulate, curved falcately upwards, lowest one as long as the keel: spurs of the vexillum introflexed and slightly callous: legumes villous.—*Wight! cat. n.* 762.—Collæa trinervia, *Wall.! L. n.* 5571 (not DC.)——Neelgherries.

Closely allied to the former, but larger, and with larger flowers and a longer calyx.

792. (3) A. *rugosa* (W. & A.:) branches slender, elongated, diffuse, tomentose: leaflets obovate, densely velvetty on both sides; upper rugose; under strongly reticulated, whitish: stipules oval, adpressed: peduncles 2-flowered, occasionally very short: calyx shortly tomentose; segments lanceolate, acuminated, slightly curved upwards, lowest shorter than the corolla: vexillum slightly thickened along the claw and base of the limb: legume velvetty.—*Wight! cat. n.* 761.—Rhynchosia? velutina, *Graham? in Wall. L. n.* 5501.——Neelgherries.

Digitized by Google

We quote Wallich's List with doubt for the following reason: Dr Graham informs us that he has not that number among the specimens sent to him for description; but he has one, which he has permitted us to examine, numbered 5504, that is exactly the same as our plant: but this specimen, it seems, does not belong to 5504, and is in Dr Graham's opinion 5582. *a*, which Dr Wallich at p. 204 desires to be erased. We, however, think that the whole mistake arises from its having been hurriedly marked 5504 instead of 5501.

785. (4) A. *lineata* (W. & A.:) branches elongated, twiggy; young parts villous with short white hairs: leaflets narrow cuneate-lanceolate, acuminated; upper side even, slightly pubescent; under white, shortly adpressed-villous, marked with the prominent nerves: stipules narrow-subulate, slightly spreading, caducous: pedicels axillary, in pairs: calyx shortly villous; segments triangular-acuminated, lowest one subulate and 2–3-times shorter than the corolla: legumes villous.—Cajanus lineatus, *Grah.! in Wall.! L. n.* 5578. —Glycine lineata, *Heyne.*

LV. DUNBARIA. *W. & A.*

Calyx ebracteolate, campanulate, 4-cleft to the middle: upper segment slightly split at the apex, rather longer than the lateral ones, a little shorter than the lowest; all lanceolate, acute or acuminated. Corolla 2–3-times longer than the calyx, persistent, scariose, papilionaceous: vexillum longer than the other petals and embracing them, with two large callosities at the base of its limb: alæ oblong-linear, with a spur on each side near the base: keel falcate, obtuse, rather shorter than the alæ. Stamens diadelphous (9 and 1). Ovary 1–5-ovuled. Style ascending: lower part slender, hairy; upper glabrous. Stigma small, slightly capitate. Legume longer than the calyx, compressed, oblong-linear, 1–5-seeded, much compressed externally and with cellular partitions internally between the seeds. Seeds roundish: hilum and carunculus small.—Twining, suffrutescent plants. Young branches and under side of the leaflets usually more or less tomentose. Leaves pinnately trifoliolate: lateral leaflets broadly and obliquely ovate, acuminated. Stipules general and partial caducous. Racemes axillary, lax, with large broadly ovate caducous bracteas. Pedicels in pairs, slender. Flowers large.

Dedicated to Professor George Dunbar of Edinburgh.

793. (1) D. *Heynei* (W. & A.:) leaflets nearly glabrous on both sides; terminal one cuneate-obovate, acuminated: petioles and nerves of the leaflets underneath sprinkled with spreading hairs: calyx herbaceous; upper segment about equal to and as broad as the lateral ones: legume about 5-seeded, covered with softish spreading hairs.—Collæa gibba, *Graham! in Wall.! L. n.* 5572. *a.*

794. (2) D. *ferruginea* (W. & A.:) leaflets pubescent on the upper surface, when young villous on the under; terminal one cordate-ovate, acuminated: petioles and nerves of the leaflets underneath covered with rusty-coloured tomentum: calyx herbaceous; upper segment about equal to and as broad as the lateral ones: spur on the lower margin of the alæ very small, obtuse: legume about 4–5-seeded, softly velvetty.—*Wight! cat. n.* 878 (partly).—Cylista? ferruginea, *herb. Madr.!*—Collæa venosa, *Graham! in Wall.! L. n.* 5573.——Neelgherries. Mysore; *Heyne.*

Our specimens of this species are neither numerous nor perfect, but if the above characters be constant, it can scarcely be united with the following.

795. (3) D. *latifolia* (W. & A.:) leaflets slightly pubescent or at length nearly glabrous above, tomentose and finally densely pubescent beneath; terminal one broadly rhomboid (broader than long), acuminated: bracteas

Digitized by Google

3-toothed at the apex: calyx somewhat thin and membranaceous; upper segment narrow-lanceolate, longer and narrower than the lateral ones: both spurs on the alæ linear-subulate: legume 1-2-seeded.—*Wight! cat. n.* 878 (partly).—Collæa gibba, *Graham! in Wall.! L. n.* 5572. *b, c.*——Dindygul hills.

LVI. CYLISTA. *Ait.*

Calyx ebracteolate, scariose (or membranaceous?), deeply 4-cleft; upper segment 2-lobed (or bifid?); lateral ones much smaller; lowest very large. Corolla much smaller than the calyx, papilionaceous, persistent: vexillum with two callosities at its base: keel slightly falcate, its petals distinct from the base to the curve: alæ linear-oblong, spurred at the base on the upper margin, slightly gibbous on the lower. Stamens diadelphous (9 and 1). Ovary oblong, with 1 (or 2?) ovule. Lower part of the style slender, hairy, recurved along the lower suture of the ovary; upper part tumid, glabrous, ascending and parallel to the lower part. Legume obliquely oval, enclosed within the calyx, 1- (or 2?-) seeded. Seed compressed, reniform, with a small hilum and inconspicuous carunculus.—Perennial twining shrubby, pubescent or villous plants. Leaves pinnately trifoliolate: leaflets oblong or ovate, acuminated. Partial stipules very minute or wanting. Racemes axillary. Bracteas very caducous.

We are uncertain whether or not *C. villosa*, Ait., belongs to this genus, as we have never had an opportunity of examining its flowers; it probably has the callosities on the vexillum, Andrews having at one time placed it in *Dolichos*.

796. (1) C. *scariosa* (Ait.:) racemes shortly peduncled, about as long or a little longer than the leaves: calyx twice as long as the corolla; tube short, campanulate; segments very large, thin and scariose, reticulated with coloured veins; upper one broad, 2-lobed, the lobes ovate-obtuse; lower the largest, cymbiform; lateral ones much smaller than the others, cordate-ovate.—*Ait. hort. Kew.* 3. *p.* 512; *DC. prod.* 2. *p.* 410; *Spr. syst.* 3. *p.* 194; *Roxb.! Cor.* 1. *t.* 92; *fl. Ind.* 3. *p.* 320; *Wall.! L. n.* 5586; *Wight! cat. n.* 765.——Circars.

We have uniformly found the ovule and seed solitary; Roxburgh likewise appears to have found them so: but most authors describe the legume as somewhat 2-seeded; perhaps their characters have been derived from the plant in a state of cultivation, and ought therefore to be regarded as of little value.

LVII. CYANOSPERMUM. *W. & A.*—Cylista, *Roxb.* (partly).

Calyx herbaceous, ebracteolate, bilabiate, divided almost to the base; lips about equal: upper cuneate, bifid; lower tripartite; segments oblong-linear, the middle one scarcely longer than the others. Corolla slightly shorter than the calyx, persistent, rigidly scariose, papilionaceous: vexillum obcordate, spreading, without callosities: keel slightly falcate, obtuse; the petals distinct except for a small space at the curve. Ovary 2-ovuled. Lower part of the style ascending, slender, hairy; upper part glabrous. Stigma slightly capitate. Legume 2- (or, from the abortion of the lower one, 1-) seeded, scarcely so long as the calyx, constricted all round between the seeds and as if formed of two spherical lobes. Seeds globose, with a small hilum without a carunculus.—Twining suffrutescent tomentose plants. Leaves pinnately trifoliolate; leaflets broadly ovate, acute or acuminated. Stipules lanceo-

Digitized by Google

late: partial ones setaceous. Racemes axillary, simple: bracteas broadly oval, deciduous. Legume shortly tomentose. Seeds (in *C. tomentosum*) bluish violet.

To this genus *Cylista albiflora* of the Botanical Magazine, t. 1859, likewise belongs. It differs from *Cylista* by the habit, by the ecallose vexillum, the legume, and several other characters.

797. (1) C. *tomentosum* (W. & A.:) bracteas oval, cuspidate; calyx adpressed-villous; upper lip scarcely cleft to the middle.—*Wight! cat. n.* 766. Cylista tomentosa, *Roxb.! Cor.* 3. *t.* 221; *fl. Ind.* 3. *p.* 319; *DC. prod.* 2. *p.* 410; *Spr. syst.* 3. *p.* 194; *Wall.! L. n.* 5585.——Southern provinces.

LVIII. ERYTHRINA. *Linn.; Lam. ill. t.* 608.

Calyx tubular, truncated, or 2-lipped, or spathaceous. Corolla papilionaceous: vexillum very long, obovate-oblong, without spurs or callosities at the base, much larger than the small alæ and keel. Stamens straight, nearly as long as the vexillum, diadelphous, or more or less monadelphous. Ovary stalked, with several ovules. Style glabrous, straight, subulate, incurved at the apex. Legume stalked, long, torulose, compressed between the seeds, pointed. Seeds distant.—Trees or shrubs, rarely herbaceous plants. Stipules small, free from the petiole. Leaves petioled, pinnately trifoliolate. Partial stipules gland-like. Stems and petioles sometimes prickly. Racemes elongated: pedicels usually in threes.

Besides the following, Dr Wallich (L. n. 5960), enumerates *E. picta* of the Madras herbarium, from the Missionaries' garden: this we have not seen, and cannot therefore determine if it be the same as the Linnæan species of that name: it is probably not a native of the Peninsula.

798. (1) E. *Indica* (Lam.:) arboreous, armed with numerous black prickles: stipules falcate: petioles and leaves unarmed: leaflets glabrous, entire, the terminal one broadly cordate: racemes terminal, horizontal: calyx spathaceous, contracted and 5-toothed at the apex: vexillum about three times shorter than the calyx, and about four times longer than the alæ: keel about the length of the alæ, its petals distinct: stamens monadelphous with the sheath entire at the base, thence diadelphous with the tube split: ovary 10–15-ovuled: legume 6–8-seeded.—*Lam. enc. meth.* 2. *p.* 391 (α); *DC. prod.* 2. *p.* 412; *Spr. syst.* 3. *p.* 243; *Roxb. fl. Ind.* 3. *p.* 249; *Wall.! L. n.* 5963; *Wight! cat. n.* 756.—E. corallodendron β, *Linn. sp. p.* 992.—*Rheed. Mal.* 6. *t.* 7; *Rumph. Amb.* 2. *t.* 76 (bad).

799. (2) E. *stricta* (Roxb.:) arboreous, armed with numerous white prickles: stipules falcate: petioles rarely prickly: leaves unarmed; leaflets glabrous, entire, the terminal one reniform-cordate, pointed: racemes terminal, horizontal: calyx spathaceous, entire, acute, short: vexillum about ten times longer than the calyx, and twice the length of the keel; keel 4–5 times longer than the alæ, its petals united: stamens monadelphous with the sheath entire at the base, diadelphous upwards: ovary 4–8-ovuled: legume usually 2–3-seeded.—*Roxb. fl. Ind.* 3. *p.* 251.——Anjengo in Travancore.

800. (3) E. *suberosa* (Roxb.:) arboreous, with corky deeply cracked bark: branches almost unarmed except at the insertion of the petioles: stipules lanceolate: petioles pubescent, prickly: leaves unarmed; leaflets tomentose on the under side, terminal one rhomboid and acuminated, sometimes reniform and rounded: racemes axillary or sometimes terminal, spreading: calyx tubular, 2-lipped: vexillum 5–6-times longer than the calyx, and more than twice the length of the keel; keel cordate, many times longer than the very minute alæ, its petals united: stamens monadelphous: legume 2–3-seeded.—

Digitized by Google

Roxb. fl. Ind. 3. *p.* 253; *Wall.! L. n.* 5959; *Wight! cat. n.* 757.—E. alba, *Roxb. in E. I. C. mus. tab.* 104.——Circars.

301. (4) E. *sublobata* (Roxb.:) arboreous, armed with numerous prickles: petioles pubescent, and the leaves unarmed: leaflets repand-sinuated, glabrous above, covered with soft white tomentum beneath, terminal one rhomboid: racemes terminal, erect, slender: calyx tubular, 2-lipped: vexillum 5–6-times longer than the calyx, 2–3-times longer than the keel; keel cordate, several times longer than the minute alæ, its petals united: stamens monadelphous.—*Roxb. fl. Ind.* 3. *p.* 254.—E. maxima, *Roxb. in E. I. C. mus. tab.* 105.——Mountainous parts of the Circars.

"Trunk erect, frequently of very great size," ROXB. We have considerable doubts if this be not a mere variety of *E. suberosa*: the principal differences lie in the bark, the petioles, and the racemes.

SUBTRIBE VI.—DALBERGIEÆ. *Bronn.*

Stamens variously combined. Legume 1–2-seeded, indehiscent. Cotyledons fleshy.—Trees or shrubs, often twining. Leaves unequally pinnated, rarely trifoliolate or reduced to a solitary leaflet.

LIX. BUTEA. *Roxb.*

Calyx campanulate, bilabiate; upper lip almost entire; lower 3-fid. Corolla papilionaceous; petals equally long: vexillum ovate, recurved: keel and alæ incurved. Stamens diadelphous (9 and 1). Style ascending. Stigma small, glandular. Legume stalked, flat-compressed, thin, membranaceous, with a large solitary compressed seed at the apex.—Unarmed trees or twining shrubs. Leaves pinnately 3-foliolate; leaflets large, roundish-ovate, pubescent or tomentose on the under side, with partial stipules. Racemes many-flowered. Flowers in threes, pedicelled, with two bracteoles at or near the base of the calyx.

302. (1) B. *frondosa* (Roxb.:) arboreous: racemes simple, lax: pedicels about twice as long as the calyx: calyx-segments short, slightly acute, several times shorter than the tube: corolla densely pubescent, 4–5-times longer than the calyx; vexillum ovate, acute.—*Roxb. Cor.* 1. *t.* 21; *fl. Ind.* 3. *p.* 244; *DC. prod.* 2. *p.* 415; *Spr. syst.* 3. *p.* 186; *Wall.! L. n.* 5569; *Wight! in Hook. bot. misc.* 3. *p.* 102; *suppl.* t. 32; *cat. n.* 913.—Erythrina monosperma, *Lam. enc. meth* 1. *p.* 391.—*Rheed. Mal.* 6. *t.* 16, 17.——Circars. Negapatam. Travancore.

303. (2) B. *superba* (Roxb.:) shrubby, twining: racemes simple, lax: pedicels about twice the length of the calyx: calyx-segments shortish, acuminated: corolla 4–5-times longer than the calyx; vexillum ovate, acute.—*Roxb. Cor.* 1. *t.* 22; *fl. Ind.* 3. *p.* 247; *DC. prod.* 2. *p.* 415; *Spr. syst.* 3. *p.* 186; *Wall.? L. n.* 5438.——Circar mountains.

This we have not seen: it appears to be readily distinguished from the last by its twining stems; the flowers in both are bright red, and very large.

304. (3) B. *parviflora* (Roxb.:) shrubby, twining: racemes panicled: pedicels 3–4-times shorter than the calyx: flowers very numerous: calyx-segments nearly as long as the tube, acuminated: corolla glabrous, about twice the length of the calyx: vexillum ovate, emarginate at the apex.—*Roxb. fl. Ind.* 3. *p.* 248; *in E. I. C. mus. tab.* 1990; *DC. prod.* 2. *p.* 415; *Wall.! L. n.* 5440; *Wight! cat. n.* 914.

Digitized by Google

LX. PONGAMIA. *Lam. ill. t.* 603.—Galedupa, *Lam.*; *Roxb.*

Calyx cup-shaped, somewhat truncated and 5-toothed. Corolla papilionaceous, glabrous. Stamens at first diadelphous at the base and apex and monadelphous about the middle, afterwards usually entirely diadelphous. Legume more or less compressed, more or less oval, with a short recurved point, 1-celled (neither contracted nor with partitions between the seeds), 1–2-seeded: valves concave on the inside, not separating naturally.—Trees or twining shrubs. Leaves unequally pinnated: leaflets opposite.

At least two very distinct kinds of fruit occur in this genus: one has the legume thick edged and the valves of a woody texture: the other has the seminiferous suture furnished with a short wing, and the valves thinly coriaceous or somewhat membranceous and veined. With this last *Dalbergia scandens* agrees in having a small wing along the one edge of the fruit, and in the calyx; but it differs from *Pongamia* by the legumes being quite flat and membranaceous all round the seeds and between them.—We omit here Wight's cat. n. 934; we have not seen the flower, and the fruit is far from ripe. The leaves are unequally pinnated; leaflets 3–5, opposite, elliptic-oblong, with a sudden short obtuse acumination, coriaceous: racemes compound and terminal: calyx deeply and regularly 5-cleft: legume obovate, oblique, obtuse, coriaceous, wingless, 1-seeded: seed (very immature) inserted towards the middle of the suture; ascending, with a large fleshy lobed arillus at its base. It thus appears to belong to *Connaraceæ*, and probably to *Rourea*. *Caju-Galedupa*, Rumph. Amb. 2. t. 13, has very similar fruit, but has a short point and two seeds; and it is perhaps by mistake that the leaves are in that figure represented abruptly pinnated. *Cynometra pinnata*, Lour., appears also, judging from his short and imperfect description, to be allied.

805. (1) P. *glabra* (Vent.:) arboreous: leaflets 2–3-pair, ovate or sometimes obovate, acuminated, glabrous: racemes axillary, many-flowered, about half the length of the leaves; pedicels in pairs: vexillum with two callosities prominent at the base of the limb and decurrent along the claw: ovary with two approximated ovules about its middle: legume oblong, nearly sessile, thick and somewhat woody, with a short recurved beak, tumid along both sutures.—*Vent. Malm. t.* 28; *DC. prod.* 2. *p.* 416; *Wall.! L. n.* 5878; *Wight! cat. n.* 932, 933.—Galedupa Indica, *Lam. enc. meth.* 2. *p.* 594; *Roxb. fl. Ind.* 3. *p.* 239.—Dolichos arborea, *Roxb. in E. I. C. mus. tab.* 292.—Robinia mitis, *Linn. sp. p.* 1044.—Dalbergia arborea, *Willd. sp.* 3. *p.* 901; *Spr. syst.* 3. *p.* 193.—Leguminosa indeterminata, *Wall.!* ? *L. n.* 5979 (flowers only).—*Rheed. Mal.* 6. *t.* 3; *Lam. ill. t.* 603. *f.* 1.

806. (2) P. *ovalifolia* (W. & A.:) arboreous: leaflets 4-pair, drooping, oval, obtuse, glabrous: racemes elongated, disposed along the leafless branches, slightly compound; pedicels slender, arranged along very short minutely-bracteated partial peduncles: vexillum without callosities: ovary with two approximated ovules about the middle.—*Wight! cat. n.* 917.

We have not seen the fruit: it is probably similar to that of the following.

807. (3) P. *uliginosa* (DC.:) shrubby, twining: leaflets 1–2-pair, ovate or oblong, bluntly acuminated, glabrous: racemes axillary, elongated, slightly compound, longer than the leaves, with often 1 or 2 trifoliolate leaves on their lower half; pedicels arranged along shortish minutely-bracteated partial peduncles: vexillum without callosities: ovary with 6–7 crowded ovules: legume oval or orbicular, thinly coriaceous, reticulated, with a recurved hooked point, 1-seeded; seminiferous suture margined.—*DC. prod.* 2. *p.* 416; *Wall.! L. n.* 5879; *Wight! in Hook. bot. misc.* 3. *p.* 301 (*misprinted* P. religiosa); *suppl. t.* 41 (*engraved by mistake* P. triphylla); *cat. n.* 935.—Galedupa uliginosa, *Roxb. fl. Ind.* 3. *p.* 243.—Pterocarpus, n. 416, *Linn.! in herb. Herm.*; *fl. zeyl.*—P. uliginosa, *Roxb. in E. I. C. mus. tab.* 971; *G. Don in Mill. dict.* 2. *p.* 377.—Robinia uliginosa, *Willd. sp.* 3. *p.* 1133.—Tephrosia uliginosa, *Spr.*

Digitized by Google

syst. 3. *p.* 232.—Dalbergia heterophylla, *Willd. l. c. p.* 901; *DC. l. e. p.* 417; *Spr. l. c. p.* 193.—*Rheed. Mal.* 8. *t.* 46 (descr. pretty good, fig. bad).——Swampy places near the sea in the southern provinces.

N. 919. of Wight's Catalogue is perhaps referable to this species, but the specimens are in too poor a state for determination. May *Derris pinnata*, Lour., be likewise referable here?

808. (4) P. *Heyneana* (Grah.:) twining?: leaflets ovate or oblong, or oval or obovate, obtusely acuminated, 3-pairs, glabrous: racemes axillary, panicled, elongated, with sometimes a leaf at the base of its first or second branches; pedicels on short minutely-bracteated partial peduncles: vexillum without callosities: ovary with 3–4-ovules.—*Graham! in Wall.! L. n.* 5916; *Wight! cat. n.* 920.

We retain this species distinct from the last on account of its very different appearance; the flowers are much more numerous, and the leaflets are in all our specimens considerably narrower (ovate or oblong), although in the only and very imperfect one in Heyne's herbarium they are oval or obovate, and about as broad as in *P. uliginosa*: we have not seen the fruit. Whether or not the characters we have taken from the number of ovules be constant, future observations must determine, the specimens before us not being sufficiently numerous for that purpose.

809. (5) P. *elongata* (Grah.)—*Graham in Wall. L. n.* 5915 (not 5886).

LXI. MILLETTIA. *W. & A.*

Calyx cup-shaped, lobed or slightly toothed. Corolla papilionaceous: vexillum recurved, broad, emarginate, glabrous or silky on the back. Stamens diadelphous (9 and 1), the tenth quite distinct. Legume flat, elliptic or lanceolate, pointed, coriaceous, thick margined, wingless, indehiscent, 1–2-seeded: valves closely cohering with each other all round the seeds and between them.—Twining or arboreous. Leaves very large, unequally pinnated: leaflets opposite, with a setaceous partial stipule at the base of each partial petiole. Racemes axillary, more or less branched and compound. Flowers pretty large, purplish, pedicelled, on shortish diverging partial peduncles.

This genus, besides the following, will contain *Galedupa elliptica* of Roxburgh (fl. Ind. 3. p. 242, and in E. I. C. mus. tab. 1590), with probably *G. piscidia*, Roxb., and some species described by him under *Robinia*. *Pong. grandiflora* and *sericea* of Ventenat appear also to belong to it. From *Pongamia* it is distinguished by the legume being compressed all round the seeds as in *Dalbergia*, and from the latter genus by its thick coriaceous or almost woody texture. Our character of the fruit is taken from *M. rubiginosa*, which alone we have seen in that state.—We have named it after Dr Millett of Canton, China.

810. (1) M. *rubiginosa* (W. & A.:) young parts, petioles and racemes covered with rusty tomentum: leaflets 2–3-pair, oblong-lanceolate, acuminated, when young covered with a shining yellowish adpressed pubescence, afterwards more glabrous: racemes elongated, drooping, nearly as long as the leaves, solitary, with shortish lateral peduncles bearing 3–5-flowers: calyx minutely toothed: vexillum silky on the outside, with two large tomentose callosities on the inside at its base: ovary with 3 ovules: legume linear-lanceolate, pointed.—*Wight! cat. n.* 912.——Courtallum.

811. (2) M. *splendens* (W. & A.:) young parts, petioles and racemes clothed with a short whitish or fulvous tomentum: leaflets about 3-pair, oblong-lanceolate, suddenly and shortly acuminated, slightly undulated on the margin; upper side glabrous; under clothed with a short adpressed silvery pubescence: inflorescence axillary, composed of a few approximated elongated branches; each branch a slightly compound raceme, bearing lateral short partial peduncles with several flowers on each: calyx shortly 4-cleft; upper seg-

Digitized by Google

ment the broadest, entire; under narrower and rather longer than the others: vexillum on the outside silky, on the inside glabrous all over, and at the base slightly fleshy but scarcely callous: ovary with 5 ovules, all between the middle and apex.—*Wight! cat. n.* 998.

LXII. DALBERGIA. *Linn.; Roxb.*

Calyx campanulate. Corolla papilionaceous, glabrous: keel-petals free or scarcely cohering. Stamens 8–10, variously combined, sometimes monadelphous, sometimes equally or unequally diadelphous. Ovary with several ovules. Legume usually stalked, membranaceous, reticulately veined, flat, oblong-linear, few-seeded; valves closely cohering with each other all round the seeds and between them. Seeds distant, compressed.—Trees or shrubs, usually twining. Leaves unequally pinnated, rarely pinnately trifoliolate. Racemes axillary.

Subgen. 1. BRACHYPTERUM. Leaves pinnated; leaflets opposite. Calyx obliquely truncated. Anthers ovate. Legumes with a narrow wing or margin along the seminiferous suture.

812. (1) D. *scandens* (Roxb.:) twining: leaflets opposite, oblong-lanceolate, obtuse at the apex: petioles channelled: racemes axillary, longer than the leaves; pedicels fascicled, slender; calyx with 2 minute caducous bracteoles at its base, truncated, with a short tooth opposite to the keel, otherwise entire: vexillum callous at the base of the limb; alæ ciliated at the base: stamens all connected a little above the base, unequally diadelphous (9 and 1) at the base and above the middle: legume almost sessile, linear-lanceolate, 2–3-seeded, with a keel along the upper suture.—*Roxb. Cor.* 2. *t.* 192; *fl. Ind.* 3. *p.* 232; *DC. prod.* 2. *p.* 417; *Spr. syst.* 3. *p.* 193; *Wall.! L. n.* 5857.—*Rheed. Mal.* 6. *t.* 22; *Pluk. t.* 338. *fol.* 27. *pl.* 4.—*α*; partial stipules short-subulate, somewhat persistent.—*Wight! cat. n.* 922.—*β*; partial stipules very caducous.—*Wight! cat. n.* 923.

Subgen. 2. EUDALBERGIA. Leaves pinnated; leaflets alternate. Calyx more or less 5-cleft. Anthers didymous. Legumes stalked, without a margin or wing.

a. Stamens all united into a sheath split on the upper side.

813. (2) D. *Sissoo* (Roxb.:) arboreous: leaflets 3–5, alternate, orbicular or obcordate, with a short sudden acumination, slightly waved on the margin; when young pubescent, when old glabrous and shining: panicles axillary, composed of several short subsecund spikes: flowers almost quite sessile: calyx-segments oblong, two upper ones obtuse, three lower acute: stamens 9, all united into a sheath open on the upper side: ovary pubescent: style very short, much shorter than the ovary: stigma large, glandular: legume stalked, linear-lanceolate, about 3-seeded.—*Roxb. fl. Ind.* 3. *p.* 223; *DC. prod.* 2. *p.* 416; *Wall.! L. n.* 5850; *Wight! cat. n.* 929.—Pterocarpus Sissoo, *Roxb. in E. I. C. mus. tab.* 970.

814. (3) D. *latifolia* (Roxb.:) arboreous: leaflets 3–7, generally 5, alternate, orbicular, emarginate; upper side glabrous; under when young minutely pubescent: panicles axillary, branched and divaricating; flowers on short slender pedicels: calyx-segments oblong, more or less obtuse: stamens 9 (or 10?), all united into a sheath open on the upper side: ovary stalked, about 5-ovuled, glabrous: style slender, nearly as long as the ovary: stigma small: legume stalked, oblong-lanceolate, usually 1-seeded.—*Roxb. Cor.* 2.

Digitized by Google

t. 113; *fl. Ind.* 3. *p.* 221; *DC. prod.* 2. *p.* 416; *Spr. syst.* 3. *p.* 193; *Wall.! L. n.* 5852; *Wight! cat. n.* 930.——Circar mountains.

We have never seen more than 9 stamens; Roxburgh, however, describes and figures 10.

815. (4) D. *sissooides* (Graham:) arboreous?, glabrous: leaflets 5–7, alternate, elliptic-ovate, with a short bluntish acumination: panicles axillary, branched, lax, about half the length of the leaves: flowers on slender shortish pedicels: calyx-segments oval, obtuse: stamens 9, all united into a sheath open on the upper side: ovary stalked, 4–5-ovuled, glabrous: style straight, a little shorter than the ovary: stigma small.—*Graham! in Wall.! L. n.* 5876; *Wight! cat. n.* 907, 931.——Neelgherries. Courtallum.

816. (5) D. *congesta* (Grah.:) woody, climbing?: leaflets 5–7, cuneate-oval, emarginate, with numerous fine parallel diverging veins, when young pubescent on both sides: petiole and peduncles pubescent: racemes axillary, densely fascicled, compound, short, corymbose; pedicels very short: calyx at length nearly glabrous, 5-cleft; segments roundish: stamens 9, all united into a sheath open on the upper side: ovary glabrous, stalked: style slender: stigma small.—*Graham! in Wall.! L. n.* 5872.——Neelgherries; *Noton.*

The only specimen in Dr Wallich's collection is an exceedingly imperfect one; and we hesitate very much to separate it from *D. rubiginosa;* the flowers, however, are more dense, the calyx, although at first very pubescent, becomes during flowering nearly quite glabrous, and the upper surface of the leaflets are dull and pubescent, while we have observed them glabrous and shining in all states in the other: the stamens are not more than 9, whereas in *D. rubiginosa,* Roxburgh describes and figures 10, but on that we are not inclined to place much reliance.

817. (6) D. *rubiginosa* (Roxb.:) trunk woody, climbing: leaflets 5–7, alternate, oblong or oval, obtuse or retuse, with numerous fine diverging parallel veins, when young minutely pubescent on the under side, when old glabrous: petioles and peduncles pubescent: racemes fascicled, axillary, compound, short, rather lax; pedicels very short: calyx pubescent, 5-cleft; segments short, oblong, obtuse: stamens 10 (or 9?), all united into a sheath open on the upper side: ovary glabrous, stalked: style slender: stigma small.—*Roxb. Cor.* 2. *t.* 115; *fl. Ind.* 3. *p.* 231; *DC. prod.* 2. *p.* 416; *Spr. syst.* 3. *p.* 193; *Wight! cat. n.* 924.——Circar mountains.

Our specimens are nearly in the same state with those of Roxburgh: the fruit is unknown. We have seen very few flowers in an examinable state; in one we counted 10 stamens, in others we could not perceive more than 9.

b. Stamens equally diadelphous (5 and 5).

818. (7) D. *volubilis* (Roxb.:) twining: leaflets about 5 pair, alternate or nearly opposite, oval, obtuse, glabrous: panicles terminal and axillary, large, branched, spreading: calyx pubescent, 5-cleft: vexillum with a large callosity at the base of the limb, reniform-cordate: stamens 10, equally diadelphous: ovary slightly pubescent: style slender: legume stalked, linear-oblong, obtuse.—*Roxb. Cor.* 2. *t.* 191; *fl. Ind.* 3. *p.* 231; *DC. prod.* 2. *p.* 417; *Spr. syst.* 3. *p.* 193; *Wight! cat. n.* 925.——Circar mountains.

819. (8) D. *paniculata* (Roxb.:) arboreous: leaflets 5–6 pair, alternate, obovate oblong or oval, usually emarginate, glabrous, minutely reticulated underneath with veins: petioles and peduncles pubescent: panicles terminal or axillary, compound, spreading: calyx pubescent or hairy, 5-cleft, lowest segment longest and narrowest: vexillum without callosities, as long as the alæ and twice as long as the keel: stamens 10, equally diadelphous: ovary glabrous: legume lanceolate, usually 1- (sometimes 2-) seeded.—*Roxb. Cor.* 2. *t.* 114; *fl. Ind.* 3. *p.* 227; *DC. prod.* 2. *p.* 417; *Spr. syst.* 3. *p.* 193; *Wall.! L. n.* 5848; *Wight! cat. n.* 926, 927, 928.——Circars. Columala.

Digitized by Google

820. (9) D. *frondosa* (Roxb.:) arboreous: bark smooth: leaflets about 5 pair, cuneate-oval, emarginate, when very young silky, afterwards glabrous or sprinkled on the underside with a few hairs: panicles axillary, pubescent; flowers secund, racemose along the ultimate branches of the panicle: calyx hairy; two upper segments obtuse, lower ones more acute, lowest the narrowest and longest: vexillum with a large callosity at the base of the limb; alæ as long as the vexillum, about twice as long as the keel: stamens equally diadelphous: ovary very slightly pubescent: legume lanceolate, 1–4- (usually about 2-) seeded.—*Roxb. hort. Bengh. p.* 53; *fl. Ind.* 3. *p.* 236; *DC. prod.* 2. *p.* 417; *Wall.! L. n.* 5855; *Wight! cat. n.* 918, 921.—D. arborea, *Heyne in Roth, nov. sp. p.* 330; *DC. l. c.*——Courtallum. Travancore.

Dr Wight's two numbers are very different in appearance. No. 918. has the leaflets approximated and is in fruit, but is obviously taken from an older part of the tree; it is from Travancore: n. 921, from Courtallum, is in flower only, and corresponds with *D. arborea* of Heyne; it has the leaves tender, and the leaflets more distant; the specimens have been apparently taken from young shoots, and have a drooping aspect. Dr Wallich conjoins both. We have some doubts, judging from the description, if *D. lanceolaria*, Linn., be not this very species; the leaflets, however, are said to be hirsute: it is only yet known as a Ceylon plant, the Malabar station being taken from Rheede, whereas Rheede's plant is *D. scandens*.

821. (10) D. *spinosa* (Roxb.:) shrubby, erect, glabrous: ultimate branches distichous, horizontal, rigid, and almost spinescent: leaves fascicled; leaflets 3–4 pair, alternate or nearly opposite, very small, elliptic or cuneate-oblong, retuse: racemes fascicled, secund, recurved, glabrous: calyx glabrous; segments oblong, obtuse: vexillum longer than the keel and alæ, without callosities: stamens equally diadelphous: ovary stalked, 4-ovuled.—*Roxb. fl. Ind.* 3. *p.* 233; *Wight! cat. n.* 798.—D. horrida, *Graham in Wall. L. n.* 5877.

Roxburgh says the legume is oval and 1-seeded; we have not seen it, and as Dr Wallich feels uncertain that ours is the same with Roxburgh's plant (from Chittagong), we have derived the above specific character from the specimens before us alone.

LXIII. PTEROCARPUS. *Linn.; Lam. ill. t.* 602.

Calyx 5-cleft, somewhat bilabiate. Corolla papilionaceous, glabrous: keel-petals distinct or slightly cohering. Stamens 10, variously combined. Ovary long-stalked. Legume indehiscent, irregular, somewhat orbicular, surrounded by a wing, woody and often rugose in the middle, 1–3-celled. Seeds solitary in each cell, reniform.—Unarmed trees or shrubs. Leaves unequally pinnated. Racemes axillary or forming terminal panicles.

822. (1) P. *santalinus* (Linn.:) arboreous: leaflets 3 (rarely 4 or 5?), roundish, retuse, glabrous: racemes axillary, simple or branched: petals long-clawed, all waved or curled on the margins: stamens triadelphous (5, 4, and 1): legume stalked, 1-seeded; the wing somewhat membranaceous, waved.—*Linn. suppl. p.* 318; *Willd. sp.* 3. *p.* 906; *DC. prod.* 2. *p.* 419; *Spr. syst.* 3. *p.* 192; *Wall.! L. n.* 5844; *Wight! cat. n.* 908.——Paulghaut mountains; *Koenig*.

We have never seen more than 3 leaflets: the specimens with 4 or 5 may belong probably to the next species.

823. (2) P. *marsupium* (Roxb.:) arboreous: leaflets 5–7, alternate, elliptical, usually deeply emarginate, glabrous: panicles terminal: petals long-clawed, all waved or curled on the margins: stamens combined into a sheath, split down to the base on the upper side, and half way down on the lower: legume long-stalked, surrounded by a broad membranaceous wing, obtuse at the base, 1- or rarely 2-seeded.—*Roxb. Cor.* 2. *t.* 116; *fl. Ind.* 3. *p.* 234;

Digitized by Google

DC. prod. 2. *p.* 418; *Spr. syst.* 3. *p.* 192; *Wall.! L. n.* 5842; *Wight! cat. n.* 911.—P. bilobus, *Roxb. in herb. Lamb.*; *G. Don in Mill. dict.* 2. *p.* 376.—*Rheed. Mal.* 6. *t.* 25? (very bad).——Columala.

*824. (3) P. *dalbergioides* (Roxb.:) arboreous: leaflets about 9, alternate, ovate-lanceolate, glabrous: panicles terminal, much branched: bracteas ovate, caducous: bracteoles minute, oblong, pressing upon the calyx, caducous: petals long-clawed, all curled and waved on the margins: stamens equally diadelphous from the base upwards: legume long-stalked, surrounded by a broad membranaceous wing, attenuated at the base, usually 1- sometimes 2-seeded.—*Roxb. fl. Ind.* 3. *p.* 236; *in E. I. C. mus. tab.* 1587; *DC. prod.* 2. *p.* 418; *Wall.! L. n.* 5843 (partly); *Wight! cat. n.* 910.

Our specimens are from the Madras herbarium, and were perhaps from the Missionaries' Garden. Roxburgh mentions the Andaman islands as the native place.

825. (4) P. *Wallichii* (W. & A.:) arborescent: leaflets about 9, alternate, ovate or oval, with a sudden bluntish acumination, glabrous: panicles axillary, composed of a few simple lax racemes: bracteas subulate, caducous: bracteoles longish, setaceous, spreading, caducous: petals long-clawed, all curled and waved on the margins: stamens all united into a sheath split down on the upper side only.—*Wight! cat. n.* 909.—P. dalbergioides, *Wall.! L. n.* 5843. *d.*

We have not yet seen the fruit.

TRIBE II.—MIMOSEÆ. *R. Brown.*

Flowers regular or nearly so, often polygamous, rarely all bisexual. Sepals 4–5, equal, often combined into a 4–5-toothed calyx: æstivation valvular or very rarely imbricative. Petals 4–5, equal, usually hypogynous, rarely inserted into the bottom of the calyx, sometimes distinct, sometimes all more or less united: æstivation valvular, or very rarely imbricative. Stamens inserted with the petals, distinct or monadelphous, as many or several times as many as the petals. Embryo straight, the radicle never being bent along the lobes of the cotyledons: cotyledons usually foliaceous. Podosperm usually flexuose or twisted.—Leaves abruptly pinnated or bipinnated.

SUBTRIBE I.—ACACIEÆ.

Calyx and corolla with the æstivation valvular.

LXIV. ENTADA. *Adans.*; *DC.*

Flowers polygamous, bisexual and male. Petals 5, distinct, or slightly connected at the very base. Stamens 10–25; anthers tipped with a gland. Legume compressed, evidently jointed, joints 1-seeded; the valves jointed and in maturity separating from each other; the sutures (or replum) persistent. Seeds thick, naked. Cotyledons thick, remaining unchanged under ground during germination.—Climbing unarmed immense shrubs. Leaves bipinnated or conjugately pinnated, the rachis often ending in a tendril. Flowers white or pale yellow, spiked, very numerous, several abortive. Legumes glabrous, unarmed, very large.

826. (1) E. *Pusætha* (DC.:) leaves bipinnated; pinnæ 2 pairs (sometimes only 1 pair); leaflets 2–5 pair, glabrous on both sides, oblong-obovate or

Digitized by Google

ovate, emarginate: spikes solitary or in pairs, axillary, usually on a former year's shoots from which the leaves have fallen, sometimes on the young shoots: petals connected at the base: stamens 10: legume more or less twisted.—*DC. prod.* 2. *p.* 425; *Wall.! L. n.* 5294.—E. monostachya, *DC. l. c.*; *Wall.! L. n.* 5293.—E. Rheedei, *Spr. syst.* 2. *p.* 325.—E. Parrana, *Spr. l. c.* (partly).—Pusætha, n. 644, *Linn. fl. Zeyl.*—Mimosa, n. 219, *Linn. fl. Zeyl.*—M. scandens, *Linn. sp. p.* 1501 (partly); *Roxb. fl. Ind.* 2. *p.* 554.—M. Entada, *Linn. sp. p.* 1502.—Acacia scandens, *Willd. l. c. p.* 1057.—*Rheed. Mal.* 8. *t.* 32, 33, 34; *and* 9. *t.* 77; *Rumph. Amb.* 5. *t.* 4.——Malabar.

When the plants are young, the spikes are frequently axillary on the young shoots as in Rheede's 9. t. 77; which has made some botanists suppose that there are two species in India.

LXV. MIMOSA. *Adans.; Gærtn. fr.* 2. *t.* 155.

Flowers polygamous, bisexual and male. Petals 4–5, united into a somewhat infundibuliform 4–5-cleft corolla. Stamens 4–15, equal to the number of divisions of the corolla, or twice or thrice as many, inserted into the base of the corolla, or on the stalk of the ovary. Legume compressed-flat, composed of 1 or more 1-seeded joints; the sutures persistent: valves somewhat membranaceous. Seeds naked.—Petioles with stipules. Leaves conjugately, or digitately, or doubly pinnated. Flowers reddish or white, capitate.

We pass over *M. pudica*, Linn. (Wall.! L. n. 5292, and Wight's cat. n. 568), as it is a native of no part of India.

827. (1) M. *hamata* (Willd.:) branches, petioles, and peduncles pubescent and armed with scattered prickles: leaves bipinnated: pinnæ 4 pairs; leaflets 7–8 pair, minute, linear-oval, approximated, pubescent: peduncles longer than the leaves, bearing one head of flowers: legumes linear, 3–7-jointed, falcately curved, pubescent, long-stalked; sutures emarginate between the joints, and with the stalk prickly.—*Willd. sp.* 4. *p.* 1033; *DC. prod.* 2. *p.* 427; *Wight! cat. n.* 567.—M. armata, *Rottl.!; Spr. syst.* 2. *p.* 206; *Wall.! L. n.* 5290.

828. (2) M. *rubicaulis* (Lam.:) branches and petioles armed with scattered hooked prickles: leaves bipinnated; pinnæ 5 pair, with a bristle-shaped gland between each pair; leaflets 10–12 pair, oblong-linear, adpressed-pubescent: stipules subulate, at the base of the common and partial petioles; the former free from, the latter cohering with the petioles: peduncles 1-headed, several together in the axils of the upper and usually abortive leaves: flowers octandrous: legume sessile, compressed-flat, glabrous, obscurely jointed; sutures straight, prickly or sometimes unarmed.—*Lam. enc. meth.* 1. *p.* 20; *DC. prod.* 2. *p.* 429; *Wall.! L. n.* 5289; *Wight! cat. n.* 565.—M. octandra, *Roxb. Cor.* 2. *t.* 200; *fl. Ind.* 2. *p.* 564.—M. Rottleri, *Spr. syst.* 2. *p.* 206.—M. spinosiliqua, *Rottl.!*

LXVI. INGA. *Plum.; Willd.*

Flowers polygamous, bisexual and male. Calyx 5-toothed. Petals 5, united into a 5-cleft corolla. Stamens numerous, protruded, monadelphous at the base or sometimes for nearly their whole length. Legume broadly linear, compressed, 1-celled. Seeds covered usually with pulp, more rarely with a pellicle or farinaceous matter.—Shrubs or trees, usually unarmed. Flowers spiked or capitate, red or white.

*829. (1) I. *dulcis* (Willd.:) arboreous: extreme branches pendulous, armed with short straight stipulary thorns: leaves bigeminate (pinnæ and

Digitized by Google

leaflets each one pair); leaflets oblong, very unequal sided, obtuse, with a gland between the pinnæ and between the pairs of leaflets: petiole shorter than the leaflets: flowers capitate; heads shortly peduncled, racemose, the racemes panicled: legumes turgid, twisted: seeds glabrous and smooth, imbedded in a firm pulp.—*Willd. sp.* 4. *p.* 1005; *DC. prod.* 2. *p.* 436; *Spr. syst.* 3. *p.* 128; *Wall.! L. n.* 5282; *Wight! cat. n.* 564.—Mimosa dulcis, *Roxb. Cor.* 1. *t.* 99; *fl. Ind.* 2. *p.* 556.

Roxburgh says it was introduced into India from the Philippine islands; it is now a tree of very frequent occurrence, particularly towards the coast.

830. (2) I. *geminata* (W. & A.:) shrubby: branches simple, pubescent, filiform, flexuose, with stipulary spreading spines: leaves conjugately pinnated, with a gland between the pinnæ: leaflets 3–5 pair, with an odd one on the outside below the pairs, oblong-obovate, unequal at the base, glabrous, without glands between the pairs: petioles pubescent: flowers capitate; heads small, globose, few-flowered, on axillary slender peduncles.—*Wight! cat. n.* 591.—I. flexuosa, *Graham! in Wall.! L. n.* 5286.—Mimosa geminata, *Koen.! in herb. Linn.!, Banks!, and Smith!*

Our specimen is from Ceylon, but we believe it has also been found in the southern provinces of the Peninsula. It forms a shrub from 8 to 12 feet high.

831. (3) I. *xylocarpa* (DC.:) arboreous, unarmed: leaves conjugately pinnated, with a gland between the pinnæ; leaflets 2–4 pair, with an odd one on the outside below the pairs, ovate-oblong, acute, with a gland between each pair: peduncles in pairs, axillary, long: flowers globose-capitate: legume ovate-oblong, hatched-shaped, woody, many-seeded.—*DC. prod.* 2. *p.* 439; *Wall.! L. n.* 5277; *Wight! cat. n.* 594.—Mimosa xylocarpa, *Roxb. Cor.* 1. *t.* 100; *fl. Ind.* 2. *p.* 543.—Acacia xylocarpa, *Willd. sp.* 4. *p.* 1055; *Spr. syst.* 3. *p.* 137.

†832. (4) I. *Koenigii* (W. & A.:) thorns stipulary, stout, straight, very patent: branches flexuose, and petioles and peduncles pubescent: leaves bipinnated; pinnæ 2 pairs, with an orbicular gland between the pairs; leaflets 4 pair, with an odd one on each side below the lowest pair, obliquely oblong, mucronate, shining on the upper surface: peduncles axillary, in pairs, the length of the leaves, each with a single globular head of 8–10 flowers.—Mimosa nitida, *Vahl, symb.* 2. *p.* 103.—Acacia nitida, *Willd. sp.* 4. *p.* 1086; *DC. prod.* 2. *p.* 460; *Spr. syst.* 3. *p.* 143.

With this we are unacquainted. We have referred it to *Inga* from the pinnæ having a leaflet more on the outside than on the inner, a peculiarity unknown, we believe, in *Acacia:* it has no relation with *I. nitida,* Willd. May it not be an accidental variation of *I. geminata* with 2 pair of pinnæ?; every other character agrees very exactly. Vahl received it from Koenig.

833. (5) I. *bigemina* (Willd.:) arboreous, unarmed: leaves conjugately or bipinnated; pinnæ 1–2 pair, with a gland between each pair; leaflets 2–3 pair, short-petioled, ovate-lanceolate, acuminated, glabrous, shining, with a gland between each pair: racemes panicled, terminal, many-flowered; flowers in small globose heads: legumes spirally twisted.—*Willd. sp.* 2. *p.* 1007; *DC. prod.* 2. *p.* 439; *Spr. syst.* 3. *p.* 128; *Wight! cat. n.* 562.—I. lucida, *Wall.! L. n.* 5267 (not *H. B. K.*)—I. Wightiana, *Graham! in Wall.! L. n.* 5281.—Mimosa bigemina, *Linn. sp. p.* 1409; *Vahl, symb.* 2. *p.* 103.—M. lucida, *Roxb. fl. Ind.* 2. *p.* 544; *Rheed. Mal.* 6. *t.* 12.

The petiole is terminated by a small gland (or rather an abortive partial petiole) as in most other species; but besides, there are two pretty large concave glands on its upper surface, one between each pair of pinnæ when there are two pairs; or when there is only one pair, there is a gland about the middle of the petiole, marking the place where the other pair ought to have sprung. Of Wallich's List, n. 5267, we have merely seen the letter *b* (from

Digitized by Google

Heyne's herbarium); it has only one pair of pinnæ, and agrees with the Linnæan type of the species. No. 5281 has 2 pair of pinnæ, but we know that character to be inconstant, and Roxburgh says of his *Mim. lucida*, that it has either one or two pairs.

834. (6) I. *umbellata* (Willd.:) arboreous, armed: thorns stipulary, or often solitary (and then abortive branches), large, diverging, leaf and flower bearing: leaves bipinnated; pinnæ 1–2 pairs, with a gland between each pair; leaflets 3–10 pair, with an odd one on the outside below the lowest pair, glabrous, linear-oblong, obtuse, sessile, with an inconspicuous gland between each pair, the uppermost pair obovate: peduncles axillary, slender, 1–2 together, bearing a single globular head of few short-pedicelled flowers: stamens very long: legumes large, many-jointed, much curved, woody, slightly scabrous, at length shining.—*Willd. sp.* 4. *p.* 1027; *DC. prod.* 2. *p.* 439; *G. Don in Mill. dict.* 2. *p.* 393 (not *p.* 391. *n.* 59); *Wight! cat. n.* 563.—I. concordiana, *DC. l. c. p.* 441; *Wall.! L. n.* 5287.—Mimosa umbellata, *Vahl, symb.* 2. *p.* 103.—M. bigemina, *Koen. ! in herb. Linn.*—M. concordiana, *Roxb. fl. Ind.* 2. *p.* 556; *in E. I. C. mus. tab.* 1003.

LXVII. DESMANTHUS. *Willd.*

Flowers polygamous, bisexual and neuter. Calyx 5-toothed. Petals 5, distinct and oblong-spathulate, or united, or wanting in the neuter florets. Stamens 10, more rarely 5; the filaments in the lower flowers of each spike sterile, dilated and membranaceous or filiform. Legume continuous, thickly membranaceous, dry, flat, 2-valved. Seeds naked.—Herbaceous or suffrutescent unarmed plants. Leaves with stipules, bipinnated. Spikes axillary, peduncled, ovate or cylindrical. Flowers white, the fertile filaments usually yellow.

§ 1. *Sterile filaments flat and somewhat petaloid: legumes oblong, 4–8-seeded.*—Neptunia, *Lour.*

835. (1) D. *natans* (Willd.:) annual, floating and throwing out roots; stem here and there swollen and inflated: leaves bipinnated; pinnæ 2–3 pair; leaflets 8–12 pair: stipules obliquely cordate: peduncles axillary, solitary, longer than the leaves, with often a single bractea about the middle: flowers in oblong solitary spikes: corolla 5-petalled: stamens 10: legume stalked, oblique at the base, oblong, falcate, 6–8-seeded.—*Willd. sp.* 4. *p.* 1044; *DC. prod.* 2. *p.* 444; *Spr. syst.* 2. *p.* 325; *Wall. ! L. n.* 5295; *Wight! cat. n.* 557. —Mimosa natans, *Roxb. Cor.* 2. *t.* 119; *fl. Ind.* 2. *p.* 553.—M. prostrata, *Lam.* —Neptunia oleracea, *Lour.*—*Rheed. Mal.* 9. *t.* 21.

836. (2) D. *triquetrus* (Willd.:) bi-triennial, prostrate: stem compressed, triquetrous below: leaves bipinnated; pinnæ 2–3 pair; leaflets 10–12 pair: stipules subulate: peduncles axillary, solitary, naked or with 2 caducous bracteas about the middle: flowers globular-headed; 5-petaled, decandrous: legumes stalked, linear-oblong, equal-sided, 4–6-seeded.—*Willd. sp.* 4. *p.* 1045; *DC. prod.* 2. *p.* 444; *Spr. syst.* 2. *p.* 325; *Wall. ! L. n.* 5296; *Wight! cat. n.* 558.—Mimosa triquetra, *Vahl, symb.* 3. *p.* 102; *Roxb. fl. Ind.* 2. *p.* 552.—M. natans, *Linn. ! suppl. p.* 439.—*Pluk. t.* 307. *f.* 4.

§ 2. *Sterile filaments filiform: legumes linear, many-seeded.*—Desmanthea, *DC.*

837. (3) D. *virgatus* (Willd.:) suffruticose: stem erect, angled: leaves bipinnated; pinnæ 3–4 pair, with a large concave gland between the lowest

Digitized by Google

pair; leaflets 15–20 pair: stipules subulate: peduncles axillary, solitary, about as long as the leaves, naked; bearing a globose few-flowered head: petals 5: stamens 10: legume narrow-linear, 10–30-seeded.—*Willd. sp.* 4. *p.* 1047 (excl. syn.); *DC. prod.* 2. *p.* 445; *Spr. syst.* 2. *p.* 326; *Wall.! L. n.* 5298; *Wight! cat. n.* 569.—Mimosa virgata, *Linn. sp. p.* 1502.

LXVIII. DICHROSTACHYS. *DC.*

Flowers polygamous, bisexual and neuter. Calyx 5-toothed. Petals 5, distinct or united into a gamopetalous corolla. Stamens 10; filaments in the lower flowers of each spike sterile, linear and elongated: anthers of the fertile ones bearing a shortly stalked deciduous gland. Legume thick and coriaceous, curved and twisted, somewhat jointed, indehiscent; joints 1-seeded, scarcely separating naturally. Seeds naked.—Shrubs, often armed with stipulary thorns. Leaves pinnated; pinnæ 5–10 pair, with glands between the lower ones: leaflets numerous, linear, pubescent. Flowers in oblong-cylindrical axillary spikes: fertile stamens yellow, sterile ones white or variously coloured.

Plants so very unlike *Desmanthus* in habit and every character, except the sterile flowers being neuter, that we feel rather surprised at their having been so long conjoined with it: we therefore separate them, and adopt the name given to the section by De Candolle as that of the genus.

838. (1) D. *cinerea* (W. & A.:) thorns solitary: pinnæ of the leaves 8–10 pair; leaflets ciliated, 12–15 pair: petioles pubescent: spikes usually solitary, rarely 2–3 together, drooping, somewhat cylindric, rather shorter than the leaves: petals scarcely cohering by their margins, and forming a 5-cleft corolla.—*Wight! cat. n.* 556.—Mimosa cinerea, *Linn. sp. p.* 1505: *Roxb. Cor.* 2. *t.* 174; *fl. Ind.* 2. *p.* 561.—Desmanthus cinereus, *Willd. sp.* 4. *p.* 1048; *DC. prod.* 2. *p.* 445.—Acacia cinerea, *Spr. syst.* 3. *p.* 143; *Wall.! L. n.* 5231.—A. Dalea, *Desv. journ. bot.* 1814, 1. *p.* 69; *DC. l. c. p.* 459.—*Burm. Zeyl. t.* 2; *Pluk. t.* 121. *f.* 5.——Frequent in sterile arid soils.

LXIX. ADENANTHERA. *Linn.; Lam. ill. t.* 334.

Flowers bisexual. Calyx 4–5-toothed. Petals 4–5, lanceolate, sessile, slightly cohering at the very base. Stamens 8–10: anthers tipped with a short-stalked deciduous gland. Legume compressed, linear, membranaceous, with transverse partitions between the seeds, slightly torulose. Seeds naked.—Unarmed trees or shrubs. Leaves bipinnated. Racemes somewhat spike-like, terminal or from the axils of the upper leaves.

839. (1) A. *Pavonina* (Linn.:) leaflets oval, obtuse, glabrous on both sides: legume somewhat falcate and twisted.—*Linn. sp. p.* 550; *DC. prod.* 2. *p.* 446; *Spr. syst.* 2. *p.* 328; *Roxb. fl. Ind.* 2. *p.* 370; *in E. I. C. mus. tab.* 1427; *Wall.! L. n.* 5300; *Wight! cat. n.* 660.—*Rheed. Mal.* 6. *t.* 14; *Rumph. Amb.* 3. *t.* 109.

LXX. PROSOPIS. *Linn.*

Flowers polygamous, bisexual and male. Calyx 5-toothed. Petals 5, distinct. Stamens 10; filaments united at the very base. Legume continuous, filled with pulp, linear, cylindrical, slightly compressed, torulose, at length crumbling to pieces.—Trees or shrubs. Leaves bipinnated or occasionally simply pinnated. Flowers usually spiked, rarely in globular heads.

840. (1) P. *spicigera* (Linn.:) somewhat arboreous, armed with scattered

Digitized by Google

prickles, or sometimes unarmed: leaves rarely simply pinnated, usually bipinnated with 1–2 pair of pinnæ, and a gland between each pair; leaflets 7–10 pair, oblong-linear, obtuse, glabrous: spikes axillary, several together, elongated, filiform: anthers tipped with a deciduous gland: legumes cylindric, filled with a mealy pulp.—*Linn.! mant. p.* 68; *DC. prod.* 2. *p.* 446; *Spr. syst.* 2. *p.* 526; *Roxb. Cor.* 1. *t.* 63; *Wall.! L. n.* 5299; *Wight! cat. n.* 555.—P. spicata, *Burm. Ind. p.* 102. *t.* 25. *f.* 3.—Adenanthera aculeata, *Roxb. fl. Ind.* 3. *p.* 371.—*Pluk. t.* 121. *f.* 3.

LXXI. VACHELLIA. *W. & A.*

Flowers polygamous, bisexual and male. Calyx 5-toothed. Corolla tubular, gamopetalous, 5- (occasionally 6-) toothed. Stamens very numerous, distinct. Legume cylindrical, turgid, scarcely dehiscent, filled with pulp and a double row of seeds.—A large shrubby or small tree, armed with stipulary straight thorns. Leaves bipinnated: pinnæ 4–8 pair, with a gland below the lower pair and often between the uppermost: leaflets 10–20 pair, linear, nearly glabrous. Petioles and peduncles more or less pubescent. Flowers capitate; heads globular, 2–3 together, each on an axillary peduncle.

841. (1) V. *Farnesiana* (W. & A.)—*Wight! cat. n.* 591.—Mimosa Farnesiana, *Linn. sp. p.* 1506; *Roxb. fl. Ind.* 2. *p.* 557.—M. sepiaria, *Roxb. in E. I. C. mus. tab.* 492.—M. Indica, *Poir.*—Acacia Farnesiana, *Willd. sp.* 4. *p.* 1083; *DC. prod.* 2. *p.* 461; *Spr. syst.* 3. *p.* 145; *Wall.! L. n.* 5264.—A. Indica, *Desv. journ. bot.* 1814, 1. *p.* 69; *DC. l. c. p.* 146.—*Pluk. t.* 73. *f.* 3.

This, like *Acacia Arabica*, exudes a considerable quantity of gum. We have named this very distinct genus in honour of the Rev. G. H. Vachell, who has lately contributed largely, by means of specimens, to make the botany of China better known to Europeans.

LXXII. ACACIA. *Neck.; Willd.*

Flowers polygamous, bisexual and male. Calyx 4–5-toothed. Petals 4–5, either distinct, or united into a gamopetalous 4–5-cleft corolla. Stamens various in number (8–200). Legume continuous, dry, 2-valved. Seeds without pulp.—Shrubs or trees, unarmed, or armed with stipulary thorns or scattered prickles. Leaves, in all the Indian species, bipinnated. Flowers yellow, white, or rarely red, in globular heads or longish spikes.

§ 1. *Flowers spiked.*

842. (1) A. *Catechu* (Willd.:) arboreous: branches armed with stipulary thorns, or occasionally unarmed; young shoots, petioles and peduncles more or less pubescent: leaves bipinnated; pinnæ 10–30 pair; leaflets 30–50 pair: petiole sometimes armed on the under side with a row of prickles, with one large gland below the lowest pair of pinnæ, and between the extreme 1–6 pairs: spikes axillary, 1–4 together, shorter than the leaves: flowers numerous: petals united: stamens distinct, numerous: legumes flat, thin, straight, linear, glabrous, 4–8-seeded.—*Willd. sp.* 4. *p.* 1079; *DC. prod.* 2. *p.* 458; *Spr. syst.* 3. *p.* 143; *Wall.! L. n.* 5228; *Wight! cat. n.* 605, 609, 610, 611.—A. polyacantha, *Willd. l. c.; DC. l. c. p.* 459; *Spr. l. c.*—A. Wallichiana, *DC. l. c. p.* 458.—A. catechuoides, *Wall.! L. n.* 5229 (partly).—Mimosa catechu, *Linn. suppl. p.* 439 (from descr.); *Roxb.! fl. Ind.* 2. *p.* 563; *in E. I. C. mus. tab.* 1725.—M. catechuoides, *Roxb. fl. Ind.* 2. *p.* 562; *Cor.* 2. *t.* 175 (*under* M. catechu).

After a careful examination of our specimens compared with figures and descriptions, we cannot separate the above as species. The absence or pre-

Digitized by Google

sence of prickles on the petioles affords no distinctive character, as both states may be seen on the same specimen: thus the only difference between *A. Catechu* and *A. polyacantha* is done away. Roxburgh in his fl. Ind. separates the *A. Catechu* of the "Cor. plants" under the name of *A. catechuoides*, while he describes and figures a Bengal plant as the true *A. Catechu*, but although we have the figures and descriptions of both before us, we cannot find out the least difference, the stamens in the Peninsular plant being as distinct at the base (not monadelphous as Roxburgh says) as in the Bengal one. Roxburgh describes another allied species which he calls *A. Suma* (to which we are disposed to refer *A. Sundra*, Wall. L. n. 5227, *a*, *c*, and perhaps *d*), and quotes under it, we think erroneously, *A. polyacantha* of Willdenow: it principally differs from *A. Catechu* by the bark being white, while in *A. Catechu* it is usually dark brown.

843. (2) A. *Sundra* (DC.:) arboreous, every where glabrous: branches armed with compressed decurrent recurved stipulary prickles, sometimes entirely unarmed: leaves bipinnated; pinnæ 15–20 pair, with a gland on the petiole below the lowest pair and between the extreme pairs; leaflets 20–40 pair, small, linear, obtuse: spikes 1–3 together, axillary, peduncled, shorter than the leaves, cylindrical, many-flowered: corolla 5-cleft: stamens very numerous, distinct, legumes flat, thin, lanceolate, few-seeded; sutures straight or occasionally emarginate between the seeds.—*DC. prod.* 2. *p.* 458; *Spr. syst.* 3. *p.* 143; *Wall. L. n.* 5227 (partly); *Wight! cat. n.* 572, 607, 608.—A. chundra, *Willd. sp.* 4. *p.* 1078.—Mimosa Sundra, *Roxb. Cor.* 3. *t.* 225; *fl. Ind.* 2. *p.* 562.

This species is extremely like *A. Catechu*, and affords also the resin Catechu; it principally differs by being perfectly glabrous. The prickles are sometimes absent on one branch, and present on another, of the same tree; and even this difference may be observed on different parts of a single specimen.

844. (3) A. *ferruginea* (DC.:) arborcous, armed with conical stipulary thorns, occasionally unarmed: branches diffuse: leaves glabrous, bipinnated; pinnæ 3–6 pair, with one gland on the petiole and one between each of the 1–2 extreme pair; leaflets 10–20 pair, oblong-linear, obtuse: spikes axillary, usually in pairs, cylindrical, many-flowered: corolla 5-cleft: stamens numerous, slightly united at the very base: legumes flat, lanceolate, obtuse, hard, 2–6-seeded.—*DC. prod.* 2. *p.* 458; *Wall.! L. n.* 5226; *Wight! cat. n.* 596, 606.—Mimosa ferruginea, *Roxb.! in herb. Sm.; fl. Ind.* 2. *p.* 561; *in E. I. C. mus. tab.* 494.——Circars; *Roxburgh*. Courtallum.

"Bark deeply cracked, of a dark rusty colour, and strongly astringent."—ROXB. The legumes are also rust-coloured.

845. (4) A. *latronum* (Willd.:) somewhat arboreous, armed; thorns numerous, stipulary, very large, terete, tapering, united at the base: leaves bipinnated; pinnæ 3–5 pair, with a gland on the petiole; leaflets 6–15 pair, very small, narrow linear, obtuse, without any glands between the pairs: spikes axillary, usually in pairs, peduncled, cylindric, longer than the leaves, many-flowered: corolla 4–5-cleft: stamens numerous, distinct: legume flat, thickish, oval-falcate, 3–4-seeded.—*Willd. sp.* 4. *p.* 1077; *DC. prod.* 2. *p.* 460; *Spr. syst.* 3. *p.* 142; *Wight! cat. n.* 603.—A. umbraculifera, *Wight! in Wall.! L. n.* 4245.—Mimosa latronum, *Koen.; Linn. suppl. p.* 438 (as to the descr., but not the spec. char.); *Roxb. fl. Ind.* 2. *p.* 558; *in E. I. C. mus. tab.* 1724.—M. cornigera, *Linn.! suppl. p.* 438.

We feel quite certain that the name *latronum*, with the station and all the description sent by Koenig, and published in the Supplementum Plantarum, refers to *M. cornigera* of the same work (not of Linn.), and not to the specimen preserved in the herbarium of the younger Linnæus, and from which he drew up his specific character. We have therefore retained the specific name by which the plant is at present known. As to the specimen from which the specific character was taken, we suspect it may not have come from Koenig at all, and that the general habitat attached to "*M. cornigera*"

Digitized by Google

in the suppl. pl. belongs to it: we think it the same as Roxburgh's *Mim. dumosa*. The true *M. cornigera* was taken up by Linnæus from a figure, and without seeing a specimen: it is an American plant.—From some unknown cause, the tree at a certain stage ceases to elongate: the branches then increase horizontally to a considerable extent in all directions, forming a flat umbrella-like top: in one extensive jungle of it, near the foot of the Madura hills, every tree has assumed this remarkable form.

*846. (5) A. *dumosa* (W. & A.:) shrubby: branches terete, glabrous, armed; thorns numerous, subulate, stipulary, white, united at the base: leaves bipinnated, small; pinnæ 2–3 pair, with a hollow gland between the last pair; leaflets about 4 pair, obovate-oblong, obtuse, glabrous, very small: spikes axillary, somewhat in pairs, peduncled, much longer than the leaves, many-flowered.—Mimosa latronum, *Linn.! suppl. p.* 438 (as to the spec. char.)—M. dumosa, *Roxb. fl. Ind.* 2. *p.* 559.

The fruit is unknown.

§ 2. *Unarmed: heads of flowers globose.*

\+ Leaflets numerous, small.

847. (6) A. *stipulata* (DC.:) arboreous, unarmed: young shoots irregularly angled, and the petioles tomentose: leaves bipinnated; pinnæ 6–20 pair, with a gland on the petiole, and between each of most of the upper pairs; leaflets numerous, very unequal-sided, semihastate, acute: stipules and the bracteas large, semicordate, acuminated: peduncles aggregated, panicled; panicles terminal and in the upper axils: heads of flowers globose: corolla tubular, 5-cleft: stamens about 20, very long, monadelphous at the base: legumes flat, thin, linear-lanceolate, glabrous, 6–12-seeded.—*DC. prod.* 2. *p.* 469; *Wall.! L. n.* 5236; *Wight! cat. n.* 570.—Mimosa stipulata, *Roxb. hort. Bengh. p.* 40.—M. stipulacea, *Roxb.! in herb. Smith; fl. Ind.* 2. *p.* 549; *in E. I. C. mus. tab.* 1723.——Courtallum.

In the Bengal plant the stipules are more persistent; in ours they are deciduous, although the bracteas remain on for a long time: we can, however, see no other difference. We can point out no character between this and *A. Smithiana*, Wall.! L. n. 5237 (*Mim. Smithiana*, Roxb.)

848. (7) A. *amara* (Willd.:) arboreous, unarmed: branches terete; young shoots, petioles, peduncles, and under side of the leaflets, clothed with yellowish tomentum: leaves bipinnated; pinnæ 8–10 pair, with a gland on the petiole and between the last pair; leaflets 20–30 pair, when old somewhat glabrous: stipules lanceolate: peduncles solitary or aggregated, long and filiform, in the axils of the upper leaves, and racemose from the abortion of the leaves: flowers small, in globular heads: corolla 5-cleft: stamens long, numerous, monadelphous: legumes flat, thin, broadly linear, 3–6-seeded.—*Willd. sp.* 4. *p.* 1074; *DC. prod.* 2. *p.* 469; *Spr. syst.* 3. *p.* 141; *Wall.! L. n.* 5238; *Wight! cat. n.* 597 (partly).—A. nellyrenza (*ought to be* nella-renga) *Grah. in Wall. L. n.* 5240.—Mimosa amara, *Roxb. Cor.* 2. *t.* 122; *fl. Ind.* 2. *p.* 548.

Our specimens are from Klein's herbarium, and were named "*Mim. tomentosa*, Willd.," a circumstance the more remarkable, because it was from Klein that Willdenow had his specimens of the true *A. tomentosa*.

849. (8) A. *Wightii* (Graham:) arboreous, unarmed: branches terete; young shoots nearly or quite glabrous: leaves bipinnated; pinnæ about 9 or 10 pair, with a gland on the petiole below the lowest pair and between the uppermost pair; leaflets 15–25 pair, oblong-linear, obtuse, glabrous, glaucous on the under side: petioles pubescent: stipules subulate: peduncles solitary, axillary, bearing a capitate head of flowers: legumes thin, broadly linear, about 6-seeded.—*Grah.! in Wall.! L. n.* 5259; *Wight! cat. n.* 592, 595.—Mimosa

Digitized by Google

pulchella, *Roxb. fl. Ind.* 2. *p.* 548 (*not* A. pulchella, *Br.*)——Malabar. Southern Provinces.

We have not seen the flowers. It is so very closely allied to *A. amara*, that we almost doubt of its being a distinct species: the leaves and young branches are however much more glabrous, and the peduncles, so far as we have seen, are always solitary and in the axils of the leaves, without any tendency to form a terminal raceme.

+ + Leaflets fewer and larger.

850. (9) A. *odoratissima* (Willd.:) arboreous, unarmed: branches glabrous; leaves bipinnated; pinnæ 3–4 pair, with a gland on the petiole and between the uppermost pair; leaflets 10–14 pair, narrow, oval, obtuse, oblique, glabrous, pale on the under side: panicles terminal and axillary, the ultimate divisions cymose or somewhat umbellate: flowers in small globose heads: corolla tubular, 4-cleft to the middle: stamens monadelphous: legume flat, broadly linear, thin, thick margined, about 10-seeded.—*Willd. sp.* 4. *p.* 1063; *DC. prod.* 2. *p.* 466; *Spr. syst.* 3. *p.* 139; *Wall.! L. n.* 5234; *Wight! cat. n.* 598, 599.—A. lomatocarpa, *DC. l. c. p.* 467.—Mimosa adoratissima, *Linn.! suppl. p.* 437; *Roxb. Cor.* 2. *t.* 120; *fl. Ind.* 2. *p.* 546.—M. marginata, *Lam. enc. meth.* 1. *p.* 12.—*Rheed. Mal.* 6. *t.* 5; *Pluk. t.* 351. *f.* 4?.——Coromandel and Malabar.

851. (10) A. *procera* (Willd.:) arboreous, unarmed, nearly glabrous: branches terete: leaves bipinnated; pinnæ 3–5 pair, with a large gland on the petiole; leaflets 6–12 pair, obliquely oval, pointed, glabrous: panicles axillary, or terminal and very large: heads of flowers globular, peduncled, aggregated: stamens numerous, monadelphous: legume thin, flat, straight, linear-lanceolate, pointed, 8–12-seeded.—*Willd. sp.* 4. *p.* 1063; *DC. prod.* 2. *p.* 466; *Spr. syst.* 3. *p.* 139.—Mimosa procera, *Roxb. Cor.* 2. *t.* 121; *fl. Ind.* 2. *p.* 548.

852. (11) A. *speciosa* (Willd.:) arboreous, unarmed: young branches flexuose, glabrous: leaves bipinnated; pinnæ 1–4 pair, with a large gland a little above the base of the petiole; leaflets 4–9 pair, oval, obtuse or retuse, unequal, glabrous, with often one or two small glands near the base of the partial petioles, and small ones between the leaflets: peduncles axillary, 1–4 together, each bearing a globular head of shortly pedicelled flowers: calyx long-tubular: petals 5, united to beyond the calyx: stamens very long, numerous, monadelphous: legume thin, flat, broadly linear, remotely 8–10-seeded, not opening spontaneously.—*Willd. sp.* 4. *p.* 1066; *DC. prod.* 2. *p.* 467; *Spr. syst.* 3. *p.* 139; *Wight! cat. n.* 600.—A. Sirissa, *Ham.! in Wall.! L. n.* 5265.—Mimosa speciosa, *Jacq. coll.* 1. *p.* 47; *ic. rar.* 1. *t.* 198.—M. Sirissa, *Roxb.! in herb. Smith! and Banks!*; *fl. Ind.* 2. *p.* 544.—M. Lebbek?, *Roxb. in E. I. C. mus. tab.* 483.—M. flexuosa, *Rottl. in Ainsl. mat. med. Hind.* —*Pluk. t.* 331. *f.* 1.

There is considerable difference of appearance between the cultivated and wild specimens, but in all the essential points they agree. The wild plant has usually been confounded with *A. Lebbek*, to which it is so closely allied that Plukenet's figure, which is good, is always quoted for that species; this circumstance seems to have led De Candolle to suppose that *A. Lebbek* had been introduced into East India.

*853. (12) A. *frondosa* (Willd.:) shrubby, erect, unarmed: branches terete, glabrous: leaves bipinnated; pinnæ about 6 pair, with a gland on the petiole close to the lower pair; leaflets about 14 pair, lanceolate, acute, rather distant, pubescent on the under side: peduncles axillary, solitary or in pairs, as long as the petiole, bearing a globular head of flowers: petals 5, linear-lanceolate, distinct: stamens 10, long, distinct: legume flat, thin, linear, thickened on the margins, many-seeded.—*Willd. sp.* 4. *p.* 1076; *DC. prod.* 2.

Digitized by Google

p. 468; *Spr. syst.* 3. *p.* 140; *Wight! cat. n.* 601.—A. coronja, *Ham.! in Wall.! L. n.* 5239.

This species is very closely allied to *A. glauca*, from which it principally differs in the much broader legume; in this about three-fourths of an inch broad, in the other not a fourth. We have never met with this species in a wild state: it is very common in gardens.

§ 3. *Armed with stipulary thorns: heads of flowers globose.*

854. (13) A. *tomentosa* (Willd.:) arboreous, armed: branches terete: spines stipulary, spreading, often very large and hard: young shoots, petioles, and peduncles, clothed with yellowish tomentum: leaves bipinnated; pinnæ 10–12 pair, with an oblong gland below the lowest, and an umbilicate one between each of the 1–2 last pair; leaflets 20–30 pair, linear, obtuse, pubescent on the under side: peduncles axillary, 1–4-together, furnished about the middle with 4 small bracteas; heads of flowers globose: corolla 5-cleft: stamens numerous, distinct: stigma dilated: legume flat, thin, linear-falcate, 6–8-seeded.—*Willd. sp.* 4. *p.* 1087; *DC. prod.* 2. *p.* 462; *Spr. syst.* 3. *p.* 145; *Wall.! L. n.* 5247; *Wight! cat. n.* 593, 602.—Mimosa tomentosa, *Roxb. fl. Ind.* 2. *p.* 558; *in E. I. C. mus. tab.* 1096; *Rottl. in nov. act. nat. cur. Berol.* 1803. *p.* 208.—M. Kleinii, *Poir. enc. meth. suppl.* 1. *p.* 82.

855. (14) A. *planifrons* (W. & A.:) arboreous, armed; branches crowded at the summit, spreading in all directions, and forming a flat umbrella-like top: thorns stipulary, short conical and curved, and very long subulate terete or angled and channelled on the sides: leaves bipinnated; pinnæ 5–6 pair; leaflets 10–12 pair, very small, linear, obtuse, glabrous: petioles compressed, flat on the lower side, ciliated, without glands: peduncles axillary, aggregated, shorter than the leaves, bracteated at the base: heads of flowers globose: corolla 5-cleft: stamens numerous, distinct: legumes tumid, somewhat terete, spirally curved.—*Wight! cat. n.* 560, 587 (partly).—Mimosa planifrons, *Koen.! in herb. Linn.!*—M. horrida, *Sm.! in Rees' cycl.* (partly).—M. umbrifera, *Herb. Banks!*——Artingarry. Tanjore.

This species approaches *Mim. eburnea* of Roxburgh in its foliage and inflorescence, but the legume is different. Sir J. E. Smith had it before him when he wrote his description of *M. horrida* in Rees' Cyclopædia, and he there considered it the same as *M. eburnea*, Roxb., and has marked the specimen so; correctly remarking, however, that Roxburgh's plant was very different from that of Linnæus. Owing to this mistake, his description, partly taken from the specimen of *A. planifrons*, and partly from Roxburgh's figure of his *M. eburnea*, is applicable to neither.

856. (15) A. *Roxburghii* (W. & A.:) shrubby, glabrous, armed: leaves bipinnated; pinnæ 6 pair, approximated; leaflets 9 pair, closely approximated and almost imbricated: thorns stipulary, often longer than the leaves, united at the base: heads of flowers axillary, globose: stamens numerous, distinct: legumes linear, variously bent.—Mimosa eburnea, *Roxb.! in herb. Banks!*; *Cor.* 2. *t.* 199; *fl. Ind.* 2. *p.* 558.—M. horrida, *Smith in Rees' Cycl.*

857. (16) A. *eburnea* (Willd.:) subarboreous, glabrous, armed: leaves bipinnated; pinnæ 2–4 pair, rather distant, with a concave gland between the last pair: leaflets 5–8 pair, oval-oblong, obtuse, glabrous, slightly distant from each other: thorns stipulary, united at the base, sometimes small, sometimes very large: peduncles axillary, several together, bracteated about the middle: heads of flowers globose, small: corolla 5-cleft: stamens numerous, distinct: legume elongated, twisted.—*α*; pinnæ about 4 pair.—*Wight cat.! n.* 587 (partly).—A. eburnea, *Willd. sp.* 4. *p.* 1082; *DC. prod.* 2. *p.* 461; *Spr. syst.* 3. *p.* 144.—Mimosa eburnea, *Linn.! suppl. p.* 437.—*β*; pinnæ about 2 pair.—*Wight! cat. n.* 574.—*Pluk. t.* 121. *f.* 4.

Digitized by Google

It is remarked in the Suppl. Plant. that the same tree is furnished with various sizes of thorns and of leaves; so that our two varieties may prove not to be essentially distinct.

858. (17) A. *Arabica* (Willd.:) subarboreous, armed: branches terete, glabrous; thorns stipulary, sometimes long, sometimes short or almost wanting: leaves bipinnated; pinnæ about 5 pair, with a gland between the first and last pairs; leaflets 15–20 pair, glabrous: peduncles aggregated, axillary or forming a terminal raceme by the abortion of the leaves: heads of flowers globose: corolla 5-cleft: stamens numerous, distinct: legumes stalked, compressed, thickish, contracted on both sutures between the seeds.—*Willd. sp.* 4. *p.* 1085; *DC. prod.* 2. *p.* 461; *Spr. syst.* 3. *p.* 145; *Wall.! L. n.* 5246; *Wight! cat. n.* 576, 590.—Mimosa Arabica, *Lam. enc. meth.* 1. *p.* 19; *Roxb. Cor.* 2. *t.* 149; *fl. Ind.* 2. *p.* 557.—*Pluk. t.* 221. *f.* 1.

There are unarmed specimens of this in the Linnæan herbarium.

859. (18) A. *leucophlœa* (Willd.:) arboreous?, armed with stipulary thorns: leaves bipinnated; pinnæ 7–12 pair, with a gland below the first, and between some of the last pairs; leaflets 16–30 pair, oblong-linear, pubescent or nearly glabrous: panicles large, terminal or from the upper axils; branches and peduncles shortly tomentose: heads of flowers globose, shortly peduncled: corolla 5-cleft: stamens numerous, distinct: legume narrow, linear, long, curved, shortly tomentose (at least when young).—*Willd. sp.* 4. *p.* 1083; *DC. prod.* 2. *p.* 462; *Spr. syst.* 3. *p.* 155; *Wall.! L. n.* 5261; *Wight! cat. n.* 579, 580, 581, 582, 583, 584.—A. alba, *Willd.*; *DC. l. c.*—Mimosa leucophlœa, *Roxb. Cor.* 2. *t.* 150; *fl. Ind.* 2. *p.* 558.—M. alba, *Rottl. in nov. act. nat. cur. Berol.* 1803, *p.* 208.

There is but one species, so far as we know, in India, with a panicled globular inflorescence and stipulary thorns.

§ 4. *Armed with scattered prickles: heads of flowers globose.*

860. (19) A. *pennata* (Willd.:) diffuse, climbing: branches irregularly angled, slightly tomentose, armed with numerous small scattered nearly straight or recurved prickles: leaves bipinnated; pinnæ 8–13 pair; leaflets numerous, small, narrow-linear, semihastate, acute, glabrous: petiole tomentose, armed with a row of prickles on the under side, with a large flat gland near the base, and a small one between each of the 2–3 extreme pairs of pinnæ: peduncles aggregated, axillary, or forming naked racemes towards the ends of the branches: flowers in globular heads, polyandrous: legumes thin, 6–10-seeded.—*Willd. sp.* 4. *p.* 1090 (char. bad); *DC.*? *prod.* 2. *p.* 464; *Spr.*? *syst.* 2. *p.* 147; *Wight! cat. n.* 588.—A. cæsia, *Wall.! L. n.* 5253.—A. canescens, *Grah.! in Wall.! L. n.* 5256.—A. megaladena, *Desv. Journ. bot.* 1814. 1. *p.* 69; *DC. l. c. p.* 465.—Mimosa, n. 216, *Linn.! in herb. Herm.!*; *fl. Zeyl.*—M. pennata, *Linn. sp. p.* 1507 (excl. syn.)—M. torta, *Roxb. l. c. p.* 566.—M. ferruginea, *Rottl.!*; *Spr. syst.* 2. *p.* 207; *DC. l. c.* 431.——Courtallum.

861. (20) A. *concinna* (DC.:) diffuse: branches irregularly angled and armed with numerous scattered compressed recurved prickles: leaves bipinnated; pinnæ 6–8 pair; leaflets 15–25 pair, linear, somewhat semihastate, obtuse, mucronate, glabrous: petioles armed with hooked prickles on the under side, with a large gland near the base and another between the extreme pair: stipules large, membranous-cordate: panicles terminal and axillary, large; branches tomentose; heads of flowers globular, peduncled, 3–5 together in the axils of a small leaf or deciduous bractea: corolla 5-cleft: stamens numerous, distinct: legumes large, succulent, contracted between the seeds; valves when dry shrivelled and rugose on the surface, angled on the margin.—*DC. prod.* 2. *p.* 464; *Wall.! L. n.* 5250; *Wight! cat. n.* 566, 586, 589.—A. pennata, *DC.*? *l. c.*—Mimosa concinna, *Willd. sp.* 4. *p.* 1039; *Roxb. fl. Ind.* 2. *p.* 564.—M. rugata, *Lam. enc. meth.* 1. *p.* 20; *DC. l. c. p.* 431; *Spr.*

Digitized by Google

syst. 2. *p.* 207.—M. abstergens, *Spr. l. c.*; *DC. l. c.*—M. saponaria, *Roxb. in E. I. C. mus. tab.* 498.—*Burm. Zeyl. t.* 1; *Pluk. t.* 121. *f.* 6; *Rumph. Amb.* 5. *t.* 49. *f*2. ?

Perhaps in strict justice the specific name (*rugata*) given by Lamarck ought be retained. As to the genus, we have some doubts if it ought to be left in *Acacia*; but the legume being dehiscent and the valves not jointed, it cannot be placed in *Mimosa*. *A. rugata*, Wall. L. n. 5251, is very closely allied, and has precisely the same kind of legume.

862. (21) A. *cæsia* (W. & A.:) shrubby, diffuse, armed with numerous scattered small prickles: leaves bipinnated; pinnæ 10–14 pair, with one or two convex oblong or roundish glands on the petioles and one between each of the last 3–4 pairs; leaflets 15–40 pairs, oblong-linear, somewhat falcate, coriaceous, glabrous and shining above, pale and pubescent (or at length nearly glabrous) beneath: panicles terminal: heads of flowers globose, numerous: stamens numerous, distinct: legume linear, flat.—*Wight! cat. n.* 573, 585.—A. aliacea, *Ham! in Wall.! L. n.* 5258.—A. arrar, *Ham! in Wall.! L. n.* 5249.—A. Intsioides, *DC. prod.* 2. *p.* 464.—Mimosa cæsia, *Linn. sp. p.* 1507 (as to the reference to Plukenet's description); *Roxb.*? *fl. Ind.* 2. *p.* 565.—M. tenuifolia, *Roxb.! hort. Bengh. p.* 41.—M. pennata, *Roxb.* ? *in E. I. C. mus. tab.* 500.—*Pluk. t.* 330. *f.* 1 (good).

We have not seen ripe fruit; in our specimens the legumes appear as if they would be of a thickish texture and narrow linear; we therefore quote *M. pennata* of Roxburgh's drawings (not of the fl. Ind.) and *M. cæsia* of the fl. Ind. with doubt, as he represents the legume broadly linear, and thin. *M. tenuifolia* is omitted by Roxburgh in the fl. Indica; perhaps he meant to reunite it with his *M. cæsia*.—Linnæus has misled all his followers by quoting Pluk. t. 330. f. 3, in place of f. 1, although he refers correctly to the letterpress from which the name *cæsia* was derived: and to add to this error, he has taken his character from a specimen of *A. Intsia*, not in the least like either figure. In his Species Plantarum, he established his *Mim. Intsia* from Rheede's figure, and of course characterised it in nearly the same terms as his *M. cæsia*.

863. (22) A. *Intsia* (Willd.:) shrubby, diffuse, procumbent or climbing: branches angled, armed with numerous small recurved prickles: leaves bipinnated; pinnæ 5–8 pair; leaflets about 9 pair, linear-oblong, shining, glabrous: petioles armed with recurved prickles on the under side, with a large convex gland near the base and a small one between each of the 1–3 last pairs of pinnæ: panicles large, terminal; peduncles 3–4 together: heads of flowers globose: corolla 5-cleft: stamens numerous, distinct: legumes broadly linear, flat and thin.—*Willd. sp.* 4. *p.* 1091; *DC. prod.* 2. *p.* 464; *Spr. syst.* 3. *p.* 146; *Wall.! L. n.* 5248; *Wight! cat. n.* 575, 577, 578, 604.—A. cæsia, *Willd. l. c. p.* 1090 (excl. syn. *Pluk.*); *DC. l. c. p.* 465; *Spr. l. c. p.* 147.—Mimosa, n. 217, *Linn.! in herb. Herm.!*; *fl. Zeyl.* (excl. syn. *Pluk.*)—M. Intsia, *Linn. sp. p.* 1508; *Roxb. fl. Ind.* 2. *p.* 565; *in E. I. C. mus. tab.* 499.—M. cæsia, *Linn. sp. p.* 1507 (excl. syn. *Pluk.*, and therefore the name).—*Rheed. Mal.* 6. *t.* 4; *Pluk. t.* 122. *f.* 2.

† 864. (23) A.? *cineraria* (Willd.?:) glabrous: branches armed with very numerous prickles; prickles compressed, curved upwards, with a linear oval base: leaves bipinnated; pinnæ 1–2 pair; leaflets 5–9 pair, linear-oval: petiole armed with minute compressed prickles, without glands: stipules large, foliaceous, obliquely cordate-ovate.—*Willd.*? *sp.* 4. *p.* 1057; *DC.*? *prod.* 2. *p.* 456; *Spr.*? *syst.* 3. *p.* 137; *Wight! cat. n.* 571.—*Pluk. t.* 122. *f.* 2?

The figure by Plukenet, from which the species has been taken up and all the synonyms depend, exhibits the leaflets (at *a*) much larger than in our plant: we have, however, referred them here rather than to *Prosopis specigera*, on the supposition that the bodies he has represented at the base of the petiole may have been stipules. The only specimen we have seen is very imperfect,

Digitized by Google

without flowers or fruit: it was sent to Dr Wight by his collectors without any locality attached.

SUBTRIBE II.—PARKIEÆ.

Calyx and corolla with a more or less imbricative æstivation. Petals distinct, equal (with the stamens perigynous), or nearly so (with the stamens hypogynous and monadelphous).

LXXIII. PARKIA. *R. Brown.*

Flowers polygamous. Calyx tubular; the limb bilabiate; upper lip 2-cleft, lower 3-cleft: æstivation imbricative. Petals 5, nearly equal, the upper one a little broader than the others: æstivation connivent-imbricative. Stamens 10, hypogynous, monadelphous. Legume many-seeded, 2-valved, with a farinaceous pulp around and between the seeds.—Unarmed trees. Leaves bipinnated: pinnæ and leaflets many pairs. Stipules minute. Spikes axillary, peduncled, club-shaped: flowers on the lower half of the rachis usually male or neuter.

*865. (1) P. *biglandulosa* (W. & A.:) pinnæ 20–40 pair, the upper ones alternate; leaflets 60–100 pair, linear, obtuse, glabrous on both sides, slightly villous along the margin, approximated and somewhat imbricated: petiole with two collateral convex oblong glands near the base; common rachis hoary with whitish tomentum, with a gland between each of the last 2–7 pairs of pinnæ; partial rachis without glands.—*Wight! cat. n.* 559.—Mimosa grandiflora, *herb. Madr.!*—M. pedunculata, *Roxb.*? *fl. Ind.* 2. *p.* 551.

Our specimens were cultivated in the Missionary Garden. We refer here *Mim. pedunculata* of Roxburgh, on account of there being two glands there also at the base of the petiole: but we do so with doubt, because the glands are said to be umbilicate. *P. Roxburghii*, G. Don in Mill. dict. 2. p. 397 (*P. Brunonis*, Graham in Wall. L. n. 5288, or *Mim. biglobosa*, Roxb.) differs by having but one gland at the base of the petiole, and fewer pinnæ and leaflets.

TRIBE III.—CÆSALPINEÆ. *R. Brown.*

Corolla more or less irregular, sometimes papilionaceous, sometimes somewhat rosaceous, sometimes wanting: æstivation irregularly imbricative, never valvular. Stamens more or less unequal, always perigynous; filaments usually distinct, rarely united. Embryo straight, with the plumula generally conspicuous and large.

SUBTRIBE I.—GEOFFREÆ. *DC.*

Corolla papilionaceous or nearly so. Stamens monadelphous or diadelphous, perigynous.

LXXIV. ARACHIS. *Linn.; Lam. ill. t.* 615.

Calyx long-tubular, resembling a pedicel; the limb bilabiate. Corolla papilionaceous, resupinate. Stamens 10, inserted with the petals on the mouth of the calyx, monadelphous: the sheath fleshy, with a groove on its upper side, but not split. Ovary shortly stalked at the very base of the calyx; the stalk soon elongating. Style filiform. Stigma bearded on the inner side. Legume on a very long stalk, ovate-oblong, obtuse at both ends, gibbous, torulose, reticulated with veins, coriaceous, indehiscent, 1-celled, 2–4-seeded.

Digitized by Google

Seeds fleshy, oily.—Annual, diffuse. Stems hairy. Stipules elongated, adnate to the petiole. Leaves abruptly pinnated, without tendrils: leaflets 2 pair. Flowers 2–7 in the axils of the leaves.

* 866. (1) A. *hypogea* (Linn.)—*Linn. sp. p.* 1040; *DC. prod.* 2. *p.* 474; *Spr. syst.* 3. *p.* 190; *Roxb. fl. Ind.* 2. *p.* 280; *in E. I. C. mus. tab.* 1272; *Wall.! L. n.* 5810; *Wight! cat. n.* 915.—A. Asiatica, *Lour.*—A. Africana, *Lour.*—*Pluk. t.* 60. *f.* 2 (good); *Rumph. Amb.* 5. *t.* 156. *f.* 2.

SUBTRIBE II.—CASSIEÆ. *DC.*

Stamens distinct, or very rarely monadelphous at the base, (and then the corolla, although irregular, is not papilionaceous).

LXXV. GUILANDINA. *Juss.; Gærtn. fr.* 2. *t.* 148; *Lam. ill. t.* 336.

Sepals 5, nearly equal, combined at the base into a short urceolate tube. Petals 5, sessile, nearly equal. Stamens 10, distinct: filaments villous at the base. Style short. Legume ovate, ventricose-compressed, 2-valved, 1–2-seeded, covered with straight prickles. Seeds bony, shining, nearly globose. —Trees or shrubs, with hooked prickles on the stem and petioles. Leaves abruptly bipinnated. Flowers spicately racemose. Bracteas elongated.

(867. (1) G. *Bonduc* (Linn.:) leaflets oval or ovate, more or less pubescent, 3–8 pair, with 1–2 small recurved prickles between them on the under side.—*Linn. sp. p.* 545; *DC. prod.* 2. *p.* 480; *Spr. syst.* 2. *p.* 327; *Wall.? L. n.* 5806; *Wight! cat. n.* 615.—G. Bonduccella, *Linn.! l. c.; Wall.! L. n.* 5803; *Roxb. in E. I. C. mus. tab.* 641.—Guilandina, n. 156, *Linn.! in herb. Herm!; fl. Zeyl.*—Cæsalpinia Bonduccella, *Flem. in As. res.* 11. *p.* 159; *Roxb. fl. Ind.* 2. *p.* 357.—*Pluk. t.* 2. *f.* 2; *Rheed. Mal.* 2. *t.* 22; *Rumph. Amb.* 5. *t.* 48. *and* 49. *f.* 1.

It might be thought preferable to adopt the name *Bonduccella*, as it was of that form only that Linnæus had seen specimens, *Bonduc* having been taken up from Plukenet's figure; but the two being identical, not even varieties, we have preferred that which is simpler and not a derivative of the other.

LXXVI. CÆSALPINIA. *Linn.; Lam. ill. t.* 335; *Gærtn. fr.* 2. *t.* 144.

Sepals 5, unequal, combined at the base into a somewhat persistent cup, the lower one the larger and slightly vaulted. Petals 5, unequal, unguiculate; the upper one shorter than the others. Stamens 10, distinct: filaments villous and ascending at the base: anthers all fertile. Style filiform. Legume unarmed, compressed, 2-valved, wingless. Seeds roundish, oval, or oblong, compressed.—Trees or shrubs, prickly or unarmed. Leaves abruptly bipinnated. Flowers yellow, racemose or panicled.

868. (1) C.? *axillaris* (DC.:) arboreous: branches and petioles armed with short recurved prickles: leaves simply? pinnated: leaflets ovate, acute; flowers axillary and somewhat solitary: legumes obliquely oval, cuspidate, tapering at the base, villous, 1-seeded.—*DC. prod.* 2. *p.* 481.—Guilandina axillaris, *Lam. enc. meth.* 1. *p.* 435; *Spr. syst.* 2. *p.* 527.—*Rheed. Mal.* 6. *t.* 20.——In thick woods, near the mountains, in the provinces of Candanata, Cottate, and elsewhere; *Rheede.*

This plant is unknown except by Rheede's figure; and as in compound-pinnated leaves, he is not to be relied on with regard to the position or number of the pinnæ, so we may be allowed to doubt his accuracy in having represented them simply and unequally pinnated. Perhaps there is more than one mistake in the figure, for the shape and size of the leaflets are so pre-

Digitized by Google

cisely those of our *Mezoneurum cucullatum*, that we are much disposed to doubt if they do not belong to that plant, and the legumes to something different.

869. (2) C. *paniculata* (Roxb.:) scandent: branches and petioles armed with numerous sharp recurved prickles: leaves bipinnated; pinnæ 3–4 pair; leaflets 3–4 pair, ovate-lanceolate, somewhat coriaceous, glabrous, shining on the upper side, usually rusty-coloured beneath: flowers in terminal panicles; pedicels about equal to or longer than the flower: calyx glabrous: legume obliquely oval, cuspidate, shortly tapering at the base into a kind of short stalk, compressed, a little tumid in the middle, glabrous: seed solitary, roundish, very thick but a little compressed.—*Roxb. hort. Bengh. p.* 32; *fl. Ind.* 2. *p.* 364; *in E. I. C. mus. tab.* 1553; *DC. prod.* 2. *p.* 481; *Wight! cat. n.* 618.—Cæsalpinia, n. 157, *Linn! in herb. Herm.; fl. Zeyl.*—C. scandens, *Koen.; herb. Madr.!; Heyne in Roth, nov. sp. p.* 209; *DC. l. c. p.* 482; *Wall.! L. n.* 5829.—Guilandina paniculata, *Lam. enc. meth.* 1. *p.* 435; *Spr. syst.* 2. *p.* 327.—*Rheed. Mal.* 6. *t.* 19.——Malabar. Travancore.

This is n. 157 of the flora Zeylanica, a plant which appears to have puzzled Linnæus very much: in the first edition of the Sp. pl. p. 380, it is, along with Pluk. t. 2. f. 2, referred to *C. crista;* but in the second edition (p. 545), the synonym of Plukenet is transferred to *Guilandina Bonduc*, while that of the fl. Zeyl. is entirely omitted: in Linnæus' own copy, however, of the Sp. pl., a mst. note has been made, wherein he unites the fl. Zeyl. synonym also to *G. Bonduc*, and this has been likewise done by Willdenow. The specimen in Hermann's herbarium is without fruit.—Roth's description is accurate, except where he appears to have been deceived by the often rusty colour of the under side of the leaflets, and has described them pubescent.

870. (3) D. *Sappan* (Linn.:) arboreous, armed: pinnæ of the leaves 10–12 pair; leaflets 10–12 pair, unequal sided, obliquely oval-oblong, emarginate, paler and minutely dotted on the under side: flowers in terminal panicles: calyx glabrous: legumes compressed, woody, glabrous, elliptic-obovate, obliquely truncated, cuspidate at the apex, 3–4-seeded.—*Linn. sp. p.* 544; *DC. prod.* 2. *p.* 482; *Spr. syst.* 2. *p.* 344; *Roxb. Cor.* 1. *t.* 16: *fl. Ind.* 2. *p.* 357; *Wall.! L. n.* 5838; *Wight! cat. n.* 619, 620.—Cæsalpinia, n. 158, *Linn.! in herb. Herm.!* (without fruit); *fl. Zeyl.—Rheed. Mal.* 6. *t.* 2.

871. (4) C. *digyna* (Rottl.:) scandent, armed with numerous small recurved prickles: pinnæ of the leaves 7–10 pair; leaflets 6–10 pair, linear-oblong, obtuse, glabrous: stipules subulate: racemes supra-axillary, simple, somewhat shorter than the leaves: pedicels long slender: legume oblong, obliquely pointed, very protuberant at the seeds, glabrous, 2–3-seeded.—*Rottl.! in nov. act. nat. cur. Berol.* 1803, *p.* 198. *t.* 3; *DC. prod.* 2. *p.* 482; *Wall.! L. n.* 5839; *Wight! cat. n.* 616.—C. oleosperma, *Roxb. fl. Ind.* 2. *p.* 356.—Guilandina oleosperma, *Roxb. in E. I. C. mus. tab.* 59.

There are occasionally two ovaries in a flower, but this is so very inconstant and unnatural, that we had almost adopted in preference the much better name given by Roxburgh. "From the seeds an oil is expressed, in some parts of the country, which is used to burn in lamps."—Roxb.

872. (5) C. *mimosioides* (Lam.:) scandent; stem and branches armed with numerous straight prickles; young parts coloured, armed with prickles and glandular hairs or bristles: pinnæ of the leaves 12–30 pair; leaflets 8–16 pair, linear-oblong, obtuse, glabrous: common petiole armed with usually 3 prickles at the insertion of each pair of pinnæ, two of them on the under side recurved, one on the upper bent upwards: stipules ensiform: racemes simple, leaf-opposed and terminal: legumes short, obliquely truncated, cuspidate, about a half longer than the breadth at the top, turgid, somewhat hairy, 2-seeded.—*Lam. enc. meth.* 1. *p.* 457; *ill. t.* 335. *f.* 2; *DC. prod.* 2. *p.* 482; *Spr. syst.* 2. *p.* 344; *Wight! cat. n.* 614.—C. Simora, *Ham. in Roxb.*

Digitized by Google

fl. Ind. 2. *p.* 359.—C. horrida, *herb. Madr.!*; *Wall.! L. n.* 5836.—C. armata, *Graham! in Wall.! L. n.* 5840.—*Rheed. Mal.* 6. *t.* 8.——Mysore. Malabar.

873. (6) C. *sepiaria* (Roxb.:) scandent: branches and petioles armed with short strong sharp recurved prickles: pinnæ of the leaves 6–10 pair; leaflets 8–12 pair, linear-oblong, obtuse, when young slightly villous, afterwards more glabrous: petioles pubescent: stipules broad, semi-sagittate: racemes axillary, solitary: calyx coloured, the segments soon reflexed: legumes linear-oblong, glabrous, with a long cuspidate point, 4–8-seeded.—*Roxb. fl. Ind.* 2. *p.* 360; *in E. I. C. mus. tab.* 1240; *Wall.! L. n.* 5834; *Wight! cat. n.* 617.—Reichardia? decapetala, *Roth, nov. sp. p.* 212 (descr. bad); *DC. prod* 2. *p.* 484; *Spr. syst.* 2. *p.* 332.——Mysore. Cunnawady.

LXXVII. POINCIANA. *Linn.; Lam. ill. t.* 333; *Gærtn. fr.* 2. *t.* 150.

Sepals 5, equal or unequal, united below into a cup-shaped somewhat persistent base. Petals 5, stipitate; the upper one shaped differently from the others. Stamens 10, distinct, much longer than the petals, all fertile: filaments ascending and hairy at the base. Style very long. Legume unarmed, flat-compressed, wingless, 2-valved, several-seeded, intercepted internally between the seeds. Seeds obovate, compressed. Cotyledons flat.—Shrubs or trees, prickly or unarmed. Leaves abruptly bipinnated. Flowers large and very elegant, corymbosely panicled.

We only retain this genus in deference to other botanists, but we know of no certain character to distinguish it from the last, except the greater length of the stamens and style; formerly it was characterised by having fimbriated petals, but *P. Gilliesii* has them only slightly so, and in *P. insignis*, H. B. K., and *P. compressa*, Moç. and Sesse, they are quite entire. Mr G. Don, in Mill. dict. 2. p. 433, refers to this genus *Cæsalp. inermis* of Roxburgh (fl. Ind. 2. p. 366), and describes it with fimbriated petals. Perhaps this genus might be retained for *P. elata* alone, on account of its great difference in the calyx from all the others.

874. (1) P. *pulcherrima* (Linn.:) shrubby, armed: leaflets obovate-oblong, retuse or emarginate: flower-buds obovate, obtuse: calyx glabrous on both sides; sepals obtuse, unequal, the lower one vaulted; æstivation imbricative: petals fringed, on long claws: ovary glabrous.—*Linn.! sp. p.* 554; *DC. prod.* 2. *p.* 484; *Wall.! L. n.* 5813: *Wight! cat. n.* 621.—Cæsalpinia pulcherrima, *Swartz, obs. p.* 165; *Spr. syst.* 2. *p.* 544.—*Rheed. Mal.* 6. *t.* 1.

875. (2) P. *elata* (Linn.:) arboreous, unarmed: leaflets linear, obtuse: flower-buds obovate-oblong, acute: calyx more or less pubescent or shortly villous, particularly on the inside; sepals coriaceous, equal, lanceolate, acute; æstivation valvular!: petals fringed; ovary villous.—*Linn. sp. p.* 554; *DC. prod.* 2. *p.* 484; *Wall.! L. n.* 5812; *Wight! cat. n.* 622, 623.—Cæsalpinia elata, *Swartz, obs. p.* 166.——Coromandel and Malabar.

We are not aware that any botanist has noticed the valvular æstivation of the calyx; but this merely arises from its coriaceous nature, and being destitute of the thin and almost membranous overlapping margins of the other species. The petals are decidedly imbricated as in the tribe.

LXXVIII. MEZONEURUM. *Desf.*

Sepals unequal, combined below into a cup-shaped somewhat persistent base; lower one the longest, and sometimes vaulted. Petals 5, unguiculate, unequal. Stamens 10, distinct, villous towards the base. Style curved. Legume unarmed, somewhat foliaceous, compressed, ovate-oblong, indehiscent, 1-celled, few-seeded, with a broad foliaceous margin or wing along the seminiferous suture.—Trees or shrubs, more or less armed. Leaves abruptly bipinnated. Petioles prickly. Flowers racemose or panicled.

Digitized by Google

To this genus also belongs *Cæsalpinia enneaphylla*, Roxb. (in E. I. C. mus. tab. 1425), *C. Sumatrana*, Roxb. (in E. I. C. mus. tab. 1423), *C. hymenocarpa*, Wall. L. n. 5832, and probably some others in Wallich's List.

876. (1) M. *cucullatum* (W. & A.:) scandent, armed, very glabrous: pinnæ of the leaves 3–7 pair; leaflets 4–5 pair, ovate, pointed, coriaceous, shining on the upper side: panicles terminal and axillary, composed of a few simple rigid racemes: lower sepal much longer than the others: upper petal deeply 2-lobed, vaulted and much incurved: legume linear-oblong, thin, 1–2-seeded. —*Wight! cat. n.* 612.—Cæsalpinia cucullata, *Roxb.! fl. Ind.* 2. *p.* 358; *Wall.! L. n.* 5828; *G. Don in Mill. dict.* 2. *p.* 431.——Travancore.

The leaflets are from one to three inches long: we therefore suspect it to be also *C. grandis*, Wall. L. n. 5830, the more as Dr Wight sent specimens of this *Mezeneurum* to Dr Wallich, which must be either those referred to under *C. grandis*, or are not noticed in his list; but we have not seen that number. Of n. 5828, we have examined *a* and *e*; the latter agrees better with Roxburgh's detailed description than his own (very imperfect) specimen does.

LXXIX. PTEROLOBIUM. *R. Br.*—Reichardia, *Roth, nov. sp.*

Calyx-tube short, cup-shaped, fleshy, persistent: limb 5-partite, deciduous, petaloid, about the length of the corolla; lower segment somewhat vaulted. Petals 5, unguiculate, unequal. Stamens 10, distinct, ascending: filaments bearded below the middle. Ovary sessile, glabrous, 1-ovuled. Style ascending, glabrous, keeled at the base along the upper margin. Stigma dilated, covered with a few very short erect hairs. Legume sessile, 1-celled, samaroid, ending obliquely on the upper side in an oblong membranous striated wing. Seed solitary, attached to the apex of the cell.—Trees or large scandent shrubs, copiously armed with strong sharp hooked prickles. Leaves bipinnated. Flowers racemose.

Mr Brown instituted this genus in the Appendix to Salt's Travels to Abyssinia, for the *Kantuffa* of Bruce (*Mimosa? Kantuffa*, DC. prod. 2. p. 431), and *Cæsalpinia lacerans* of Roxburgh: we regret that as at present we have not access to that work, we have been obliged to draw up our generic character from the Indian plant alone; nor do we know how far they are distinct.

877. (1) P. *lacerans* (Brown:) shrubby, scandent: pinnæ 4–8 pair; leaflets 4–8 pair, oval, obtuse or emarginate: petioles with usually two recurved prickles on the under side between each pair of pinnæ, and one incurved one on the upper: racemes lax, in the axils of the upper leaves only; pedicels slender.—*Wall.! L. n.* 5841; *Wight! cat. n.* 635.—Cæsalpinia lacerans, *Roxb. fl. Ind.* 2. *p.* 367.—C. ligulata, *herb. Madr.!; Rottl.!; Heyne.*—Reichardia hexapetala, *Roth, nov. sp. p.* 210 (descr. bad); *DC. prod.* 2. *p.* 484; *Spr. syst.* 2. *p.* 332.——Hills of Narthamala, Pathacottah, Vendalore, &c. Circars, common; *Roxburgh.*

LXXX. PARKINSONIA. *Linn.; Lam. ill. t.* 336.

Sepals 5, equal, recurved, shortly united at the base. Petals 5, ovate, flat; upper one roundish and long-clawed. Stamens 10, distinct, declinate, a little longer than the claw of the upper petal. Style filiform, somewhat ascending. Legume linear-oblong, acuminated at both ends, torulose at the seeds and compressed between them. Seeds oblong: the testa tumid: hilum linear: cotyledons oblong: radicle ovate.—A thorny shrub; thorns solitary or in threes, straight. Leaves pinnated: petiole linear, very long, winged: leaflets small, obovate-oblong, often deciduous or quite abortive. Racemes lax. Flowers yellow.

Digitized by Google

*878. (1) P. *aculeata* (Linn.)—*DC. prod.* 2. *p.* 486; *Spr. syst.* 2. *p.* 435; *Wight! cat. n.* 613.

LXXXI. HARDWICKIA. *Roxb.*

Sepals 4–5, ovate, concave, equal, spreading, scarcely cohering together at the base. Corolla none. Stamens 8–10, distinct, inserted into the bottom of the calyx, alternately shorter: anthers ovate, apiculate. Style ascending, short. Stigma large, peltate. Legume lanceolate, 1-celled, 2-valved, opening at the apex. Seed solitary, in the apex of the legume, cuneate, thin and somewhat membranaceous on the one edge.—Glabrous unarmed trees. Leaves abruptly pinnated: leaflets 1–3-pair, coriaceous. Stipules small, caducous. Racemes axillary, panicled.

879. (1) H. *binata* (Roxb.:) leaflets 1 pair, opposite, obliquely ovate, obtuse, 4–5-nerved at the base; the stronger nerve (or midrib) next the inner margin.—*Roxb. Cor.* 3. *t.* 209; *fl. Ind.* 2. *p.* 423; *DC. prod.* 2. *p.* 487; *Spr. syst.* 2. *p.* 357; *Wall.! L. n.* 5808; *Wight! cat. n.* 624.——Guzelhelte pass. Coromandel mountains; *Roxburgh.*

880. (2) H. *pinnata* (Roxb.:) leaflets 3 pair, alternate, ovate-lanceolate, acuminated, 1-nerved; the nerve in the middle.—*Roxb. fl. Ind.* 2. *p.* 425; *DC. prod.* 2. *p.* 487; *Wall.! L. n.* 5807.——Travancore.

LXXXII. JONESIA. *Roxb.*—Saraca. *Burm.*

Calyx coloured, infundibuliform, with 2 roundish ovate opposite bracteoles at its base: tube long, closed, fleshy; crowned with a crenulated ring: limb 4-partite, spreading. Petals none. Stamens 3–9, arising from the ring at the mouth of the calyx: ovary long-stalked; the stalk below cohering with the one side of the calyx-tube, free above. Ovules 8–12. Style declinate, filiform. Stigma simple. Legume scimitar-shaped, compressed, a little turgid, 4–8-seeded.—Trees or scandent shrubs, unarmed. Leaves abruptly pinnated. Stipules intra-foliaceous. Racemes somewhat fascicled.

881. (1) J. *Asoca* (Roxb.:) arboreous: leaflets 4–6 pair, lanceolate: racemes terminal and axillary, cymose: stamens usually 7.—*Roxb. in As. res.* 4. *p.* 355; *fl. Ind.* 2. *p.* 218; *in E. I. C. mus. tab.* 935; *DC. prod.* 2. *p.* 487; *Wall.! L. n.* 5822; *Wight! cat. n.* 633.—J. pinnata, *Willd. sp.* 2. *p.* 287; *Spr. syst.* 2. *p.* 167.—Saraca arborescens, *Burm. Ind. p.* 85. *t.* 25. *f.* 2.—S. Indica, *Linn. Mant. p.* 98.—*Rheed. Mal.* 5. *t.* 59.

LXXXIII. HUMBOLDTIA. *Vahl; R. Brown.*

Calyx bibracteolate: tube turbinate, persistent: limb 4-partite, deciduous, the upper segment 2-nerved. Petals 5, or (by the suppression of the two lower ones) 3. Stamens 5, all bearing anthers, distinct, inserted into the throat of the calyx and opposite to its segments: filaments glabrous, doubled down during æstivation: anthers versatile. Ovary with several ovules, stalked, the stalk adnate to the calyx-tube on one side. Style subulate. Stigma capitate. Legume oblong, compressed.—Shrubs or small trees, unarmed. Leaves abruptly pinnated: leaflets opposite, under side furnished with a few adpressed glands. Stipules foliaceous, persistent, peltately-adnate, transversely dilated into a lobe below the point of attachment, with adpressed glands on the

Digitized by Google

under side, usually folded up (at least in the dried specimen) and resembling an outer accessory stipule. Racemes axillary; pedicels subtended by a bractea.

882. (1) H. *Brunonis* (Wall.:) branchlets solid, equal: leaflets 2 pair, cuneate-oblong, with a short obtuse acumination: back-lobe of the stipules nearly equal-sided, and rounded on both sides: petals 3.—*Wall. pl. as. rar.* 3. *p.* 17. *t.* 233; *L. n.* 2332.—H. tripetala, *herb. Heyne.*——Malabar?; *Heyne.*

*883. (2) H. *laurifolia* (Vahl:) branchlets tumid; joints fistulose: leaflets 3–5 pair, ovate-oblong, acuminated: back lobe of the stipules longer than the other and acute: petals 5.—*Vahl, symb.* 3. *p.* 106; *DC. prod.* 2. *p.* 488; *Spr. syst.* 1. *p.* 794; *R. Brown in Wall. pl. As. rar.* 3. *p.* 17.—Batschia laurifolia, *Vahl, l. c. p.* 39. *t.* 56.

We insert this, although only hitherto found in Ceylon, because it probably also occurs in the Peninsula.

LXXXIV. TAMARINDUS. *Linn.; Lam. ill. t.* 25.

Calyx tubular at the base: limb bilabiate, reflexed: upper lip 3-partite; lower broad, 2-toothed. Petals 3, alternating with the segments of the upper lip of the calyx; two of them ovate, the middle one cucullate. Stamens 9–10; 7 very short and sterile; the others (2–3) longer, monadelphous, bearing anthers. Style subulate. Legume stalked, linear, more or less curved, slightly compressed, 1-celled, 3–12-seeded, the sarcocarp pulpy. Seeds compressed, bluntly 4-angled, obliquely truncated at the hilum.—Trees. Leaves abruptly pinnated; leaflets many pair. Flowers racemose.

884. (1) T. *Indica* (Linn.)—*Linn. sp. p.* 48; *DC. prod.* 2. *p.* 488; *Spr. syst.* 3. *p.* 158; *Roxb. fl. Ind.* 3. *p.* 215; *in E. I. C. mus. tab.* 1081; *Wall. ! L. n.* 5824; *Wight! cat. n.* 916.—T. occidentalis, *Gærtn. fr.* 2. *p.* 310. *t.* 146; *DC. l. c., p.* 489.—*Rheed. Mal.* 1. *t.* 23; *Rumph. Amb.* 2. *t.* 23.

Gærtner and Roxburgh consider the West Indian species as distinct from that from the East: the only character, however, lies in the pod, the *T. orientalis* having it elongated and 6-12 seeded, the other short and 3–4-seeded. De Candolle also believes this difference to be constant: but as both kinds of legumes are found in the Peninsula, we are inclined to regard them more as varieties from cultivation, than as naturally distinct.

LXXXV. CASSIA. *Linn.; Lam. ill. t.* 332.

Sepals 5, combined at the base, more or less unequal. Petals 5, more or less unequal. Stamens 10, distinct; the 3 upper rarely fertile, usually with anthers of a different shape from the others and abortive; very rarely only 4–7, and all fertile: anthers dehiscing at the apex by two pores or clefts. Ovary stalked. Legume terete or compressed, several seeded.—Trees, shrubs, or herbaceous plants. Leaves simply and abruptly pinnated; leaflets opposite. Petioles often bearing glands.

§ 1. Fistula, *DC.—Sepals very obtuse. Anthers ovate, with two clefts. Legumes terete or compressed, indehiscent, woody, many-celled, with transverse partitions: the cells* 1*-seeded, filled with pulp. Seeds elliptical, somewhat compressed, horizontal* (i. e. *transverse with respect to the valves.*)—*Trees. Flowers large, racemose.*

885. (1) C. *Fistula* (Linn.:) small tree with usually smooth bark: leaflets

Digitized by Google

about 5- (4–8-) pair, broadly ovate, usually obtuse or retuse, sometimes slightly acuminated, glabrous: petioles without glands: stipules minute: racemes terminal, long, lax, drooping; flowers long-pedicelled: legumes cylindric, pendulous, glabrous, smooth.—*Linn.! sp. p.* 540; *DC. prod.* 2. *p.* 490; *Spr. syst.* 2. *p.* 334; *Lam. ill. t.* 332; *Gærtn. fr.* 2. *t.* 147; *Roxb. fl. Ind.* 2. *p.* 333; *Wall.! L. n.* 5302; *Wight! cat. n.* 643.—C. rhombifolia, *Roxb.? l. c. p.* 334.

A common and very widely distributed plant in India.

886. (2) C. *Roxburghii* (DC.:) arboreous with deeply cracked bark: branches spreading much; young shoots with the petioles and peduncles pubescent: leaflets 10–20 pair, oblong, unequal-sided, obtuse or somewhat emarginate and mucronate at the apex, pubescent beneath; margins coloured and slightly thickened: petioles without glands: stipules semisagittate: racemes axillary, solitary, much shorter than the leaves: legumes cylindric, very long, pendulous, glabrous, torose.—*DC. prod.* 2. *p.* 489; *Wall.! L. n.* 5308; *Wight! cat. n.* 642.—C. marginata, *Roxb.* (not *Willd.*) *fl. Ind.* 2. *p.* 338.—— Gingie hills.

Of rare occurrence in the wild state, but, from its great beauty, now common in gardens in the Peninsula. It is nearly allied to *C. Javanica*, with which it appears to have been frequently confounded, but is, we believe, quite distinct.

§ 2. Chamæfistula, *DC.—Sepals very obtuse. Anthers with* 2 *pores. Legumes terete or compressed, scarcely dehiscent, wingless, somewhat membranaceous, many-celled with transverse partitions; cells* 1*-seeded, with a little or no pulp. Seeds elliptical, somewhat compressed, horizontal.—Trees or shrubs. Flowers racemose or panicled.*

887. (3) C. *tomentosa* (Linn.:) a large shrub, with terete tomentose diffuse branches: leaflets 6–8 pair, usually with a gland between each pair, linear-oblong, mucronate, rounded and a little unequal at the base; upper side pubescent; under tomentose: racemes in the upper axils as long as or longer than the leaves, several-flowered, forming a leafy corymbiform panicle: legumes long, linear, compressed, mucronate, tomentose: seeds somewhat reniform, horizontal.—*Linn.! suppl. p.* 231; *DC. prod.* 2. *p.* 496; *Spr. syst.* 2. *p.* 338; *Wight! cat. n.* 647 —C. Wightiana, *Graham! in Wall.! L. n.* 5329.—C. multiglandulosa, *Jacq. ic. rar.* 1. *t.* 72.——Neelgherries.

C. tomentosa of Wallich's List is a very different plant.—Our specimens agree so very precisely with that of the Linnæan herbarium, from America, as well as with the descriptions in the suppl. Plant., Lamarck, Kunth, &c. that we have no doubt about the identity of the species. The Indian plant, however, appears to be also in a truly wild state; and, as a proof of this, it may be mentioned that it bears a native name, *Malay-awvarday*, in the Tamul language.—Kunth is right, but De Candolle wrong, as to the section to which it belongs.

*888. (4) C. *bicapsularis* (Linn.:) shrubby, with long weak slender terete smooth flexuose and somewhat scandent branches: leaflets 3–4 pair, glabrous, unequal at the base, obovate, obtuse, lowest pair roundish with an erect-stalked globose gland between them: stipules small, subulate, reflexed, deciduous: racemes axillary, as long as the leaves: legume large, torulose, divided longitudinally by a long partition into two large cells, that are subdivided into smaller ones by transverse partitions between each seed: seeds numerous, small.—*Linn. sp. p.* 538; *DC. prod.* 2. *p.* 494; *Spr. syst.* 2. *p.* 340; *Wall.! L. n.* 3513; *Wight! cat. n.* 646.—C. sennoides, *Jacq. ic. rar.* 1. *t.* 170; *DC. l. c.; Spr. l. c.*—Senna bicapsularis, *Roxb.! fl. Ind.* 2. *p.* 342.

We follow Roxburgh and Dr Wallich in considering this a doubtful native of India.

Digitized by Google

889. (5) C. *Sophera* (Linn.:) annual, erect, branched, glabrous: leaflets 6–12 pair, lanceolate or oblong-lanceolate, acute, with a single clavate obtuse gland near the base of the petiole: racemes terminal, or axillary and few-flowered: upper petal retuse; lowest anther small and sterile: legumes long, linear, turgid, when immature and dried compressed, glabrous, many-seeded; sutures keeled: seeds horizontal, with cellular partitions between them. —*Linn. sp. p.* 542; *DC. prod.* 2. *p.* 492; *Spr. syst.* 2. *p.* 335; *Wall.! L. n.* 5317. *a–d, h, i, n, o*; *Wight! cat. n.* 644, 659.—C. esculenta, *Roxb. in E. I. C. mus. tab.* 96.—C. purpurea, *Roxb. in E. I. C. mus. tab.* 637; *DC. l. c. p.* 497; *Spr. suppl. p.*167.—C. torosa, *Cav.; DC. l. c. p.* 491; *Spr. syst.* 2. *p.* 335.—C. torulosa, *Poir.*—C. Indica, *Poir.*—C. Coromandeliana, *Jacq. fr.* 67. *t.* 100; *DC. l. c. p.* 492; *Spr. l. c.*—C. sopheroides, *Collad.; DC. l. c. p.* 506.—Cassia n. 150, *Linn.! in herb. Herm.* (without fruit); *fl. Zeyl.*—Senna Sophora, *Roxb. fl. Ind.* 2. *p.* 347.—S. purpurea, *Roxb. l. c. p.* 342.—S. esculenta, *Roxb. l. c. p.* 346.—*Burm. Zeyl. t.* 98; *Rheed. Mal.* 2. *t.* 52; *Rumph. Amb.* 5. *t.* 97. *f.* 1.

The legumes, when unripe and dried, appear quite flat, but when ripe and fresh are turgid and almost cylindrical: from not attending to which, this species has been split into a great many. In its general appearance it much resembles *C. occidentalis*, but is readily distinguished by the position of the seeds: in *C. Sophera* the sutures are shortly keeled, so that when dried and compressed they slope towards the extreme edge; in *C. occidentalis*, from their being tumid, the legume in the same circumstances appears bordered with a thickened narrow rim. The Linnæan specimen of *C. Sophera*, which appears to have been received long after the species was established (in the fl. Zeyl. and Sp. pl.) from Hermann's herbarium, differs considerably from the figures quoted, and also from our own specimens: it is not marked from whence it was received.

§ 3. Herpetica, *DC.—Sepals obtuse. Anthers* 2*-pored. Legumes membranaceous, dehiscent, many-celled with transverse dissepiments; cells* 1*-seeded, somewhat pulpy; valves furnished with a longitudinal broad foliaceous wing along their middle. Seeds numerous, horizontal, compressed.—Shrubby or herbaceous. Flowers racemose, with a large concave deciduous bractea at the base of each pedicel.*

*890. (6) C. *alata* (Linn.:) shrubby; branches spreading, irregularly angled, glabrous: leaflets 8–14 pair, obovate-oblong, very obtuse, mucronate, glabrous or nearly so on both sides, the lowest pair close to the branch and at a distance from the next pair: petiole triangular, and the rachis without glands: stipules lanceolate, pointed, rigid, persistent: racemes terminal; legumes long, enlarged on each side with a broad crenulated wing.—*Linn.! sp. p.* 541; *DC. prod.* 2. *p.* 492; *Spr. syst.* 2. *p.* 336; *Roxb. in E. I. C. mus. tab.* 43; *Wall.! L. n.* 5301; *Wight! cat. n.* 648.—C. bracteata, *Linn. f.! suppl. p.* 232; *DC. l. c.*; *Spr. l. c.*—C. herpetica, *Jacq. obs.* 2. *t.* 45. *f.* 2.—Senna alata, *Roxb. fl. Ind.* 2. *p.* 349.—*Rumph. Amb.* 7. *t.* 18.

We have examined the specimens of Linnæus, both father and son: that of the father consisted of a legume only, and of some leaves which he thought a different species: that of the son, of a raceme and leaf; and this not being sufficient to enable him to recognise it as the same with his father's, he named it *C. bracteata*, with reference to the large bracteas. The pubescence on the under side of the leaflets appears of little consequence; in the Indian state of it, however, they are usually quite glabrous. It is certainly not indigenous.

§ 4. Senna, *DC.—Sepals obtuse. Anthers* 2*-pored. Legumes membranaceous, broad, flat-compressed, with thin edges, scarcely dehiscent, several-celled*

Digitized by Google

with transverse partitions, protuberant at the seeds, scarcely pulpy within. Seeds compressed, vertical (i. e. *the flat side parallel with the valves of the legume*), *almost obcordate, much shorter than the breadth of the legume.—Flowers in axillary racemes or terminal panicles.*

891. (7) C. *obtusa* (Roxb.:) perennial, herbaceous, diffuse, procumbent, branches glabrous: leaflets 4–6 pair, obtuse, mucronate, unequal at the base, glabrous: petioles and rachis without glands: stipules lanceolate-subulate, tapering, spreading, persistent: racemes axillary, few-flowered, much shorter than the leaves: pedicels without bracteas, legumes lunate, broad, thin, obtuse; valves protuberant and slightly angled but scarcely crested at the seeds.—*Roxb. hort. Bengh. p.* 31; *in E. I. C. mus. tab.* 1418; *Wight! cat. n.* 655.—C. Senna, *herb. Linn.!* (from *Koenig*).—C. obovata, *Wall.! L. n.* 5319.—Senna obtusa, *Roxb. fl. Ind.* 2. *p.* 344.——Not unfrequent in pastures.

The Egyptian *C. Senna* (*C. obovata*, Coll.), of which there is a specimen in the Linnæan herbarium, is so very closely allied that we have some doubts of its being really distinct: it is, however, a diffuse shrubby plant; the racemes bear a considerable number of flowers, they are as long as the leaves, and when in fruit even longer than them, and the legumes are always, so far as we have seen, furnished with a little wing or crest on the valves at the protuberances caused by the seeds. To *C. obovata*, Collad., belongs *C. Senna*, *α*, Burm. Ind. p. 96. t. 33. f. 2, *C. Senna* of Swartz (now naturalized and very abundant near the sea-beach at Port-Royal in Jamaica), and *C. Porturegalis* of Bancroft.

892. (8) C. *lanceolata* (Forsk.:) suffruticose, erect, glabrous: leaflets 4–8 pair, lanceolate, acute, nearly equal-sided: petioles and rachis without glands: stipules minute, acute, spreading or deflexed: racemes axillary, long-peduncled, many-flowered; pedicels without bracteas: legumes flat, oblong-linear, broad, slightly lunate, obtuse, very slightly tumid at the seeds.—*DC. prod.* 2. *p.* 492; *Spr. syst.* 2. *p.* 339; *Lam. ill. t.* 332. *f.* 2. *c, and f.* 3. *a; Wall.! L. n.* 5318; *Wight! cat. n.* 654.—C. orientalis, *Pers.*—C. acutifolia, *Delile, fl. d'Eg. t.* 27. *f.* 1.—Senna officinalis, *Gærtn.; Roxb. fl. Ind.* 2. *p.* 346.

Perhaps only a naturalized plant, but Roxburgh states it to be a native of the interior of India.

§ 5. Chamæsenna, *DC.—Sepals obtuse. Anthers* 2*-pored. Legumes more or less compressed, rarely somewhat cylindrical, with the sutures tumid, many-celled with complete or incomplete partitions, without pulp. Seeds vertical, ovate or* 4*-cornered, about as long as the breadth of the legume: podosperms shorter than the seed.—Flowers usually racemose.*

\+ Shrubby or arboreous.

a. *Petioles and rachis without glands: legumes straight, many-seeded, compressed, tapering to a spear-shaped point: valves when ripe somewhat woody.*

*893. (9) C. *florida* (Vahl:) arboreous: leaflets 4–14 pair, elliptic, obtuse at both ends, somewhat emarginate, with a bristle-point, glabrous, shining: petiole and rachis without glands: stipules minute, subulate, caducous: panicles terminating every branch, very large, many-flowered; peduncles densely pubescent: flowers long-pedicelled, corymbose toward the ends of the peduncles; pedicels subtended by an oblong-lanceolate concave long-pointed bractea: upper petal obcordate: legumes long, drooping, then straight, attenuated at both ends, pubescent; sutures callous, thickened.—*Vahl, symb.* 3. *p.* 57; *herb. Madr.!; DC. prod.* 2. *p.* 499; *Spr. syst. p.* 337; *Wight! cat. n.* 650.—C. Sumatrana, *Roxb. hort. Bengh. p.* 31; *in E. I. C. mus. tab.* 1421;

Digitized by Google

DC. prod. 2. *p.* 506; *Wall.! L. n.* 5305.—Senna Sumatrana, *Roxb. fl. Ind.* 2. *p.* 347.

A small but beautiful tree, particularly when in flower, every branch of it terminating in a large panicle of deep yellow blossoms. Our specimens were principally taken from a tree, perhaps introduced, growing at Negapatam; but we have it also from the missionaries, who appear to have found it wild in Tranquebar.

894. (10) C. *montana* (Heyne:) shrubby: branches glabrous, ascending: leaflets 10–12 pair, oval-oblong, obtuse at both ends, sometimes slightly emarginate, pointed with a deciduous bristle, glabrous on both sides, slightly glaucous on the under: petiole and rachis without glands: stipules minute, subulate: peduncles glabrous, many-flowered, numerous towards the ends of the branches, axillary or forming a large terminal panicle: flowers long-pedicelled, rather small: legumes linear, straight, thin, glabrous and shining, when ripe hard woody and terminating in a hard conical or lanceolate point.—*Heyne! in Roth, nov. sp. p.* 214; *DC. prod.* 2. *p.* 499; *Spr. syst.* 2. *p.* 336; *Wight! cat. n.* 645, 651.—C. setigera, *DC. l. c.; Wall.! L. n.* 5330.—— Neelgherries. Columala.

The three upper stamens are very short, which has led Roth to overlook them entirely, as he does the deciduous bristle that terminates the leaflets.

b. *Petioles or rachis furnished with glands: legumes straight, compressed, many-seeded, mucronate, the point somewhat deciduous; valves thin and papery.*

895. (11) C. *glauca* (Lam.:) arboreous: branches numerous, spreading in every direction; young ones irregularly angled, almost glabrous: leaflets 4–6 pair, with an erect clavate gland between each of the 2–3 lower pair, oval, broadest at or below the middle, the upper ones the largest; upper side glabrous, under glaucous and slightly pubescent: stipules linear-subulate, falcate: racemes axillary, corymbiform, long-peduncled, erect, crowded near the ends of the branches, about half the length of the leaves: flowers large, long-pedicelled, the pedicels subtended by an ovate acuminated caducous bractea: petals all nearly equal: anthers all fertile, equally long, the two lower on rather longer filaments than the others: legumes drooping, linear, straight, thin, glabrous, the margin a little tumid.—*Lam. enc. meth.* 1. *p.* 647; *DC. prod.* 2. *p.* 495; *Spr. syst.* 2. *p.* 338; *Wall.! L. n.* 5312; *Wight! cat. n.* 653.—C. Surattensis, *Burm. Ind. p.* 97.—C. arborescens, *Vahl* (not *Mill.*) *symb.* 3. *p.* 56; *Roxb. in E. I. C. mus. tab.* 1420.—C. sulphurea, *DC. l. c.; Spr. l. c. p.* 334.—C. enneaphylla, *Koen.*—C. planisiliqua, *Burm. l. c. p.* 98 (as to the leaves).—Senna arborescens, *Roxb. fl. Ind.* 2. *p.* 345.—Robinia Javanica, *Burm.? Ind. p.* 163.—*Rheed. Mal.* 6. *t.* 9, 10; *Rumph. Amb.* 4. *t.* 23?

896. (12) C. *suffruticosa* (Koen.:) arborescent; branches numerous, ascending; the extreme ones and young shoots slightly pubescent: leaflets 7–10 pair, with an erect clavate gland between the 2–3 lower pair, obovate-oblong, unequal and narrowest at the base, broader upwards, the extreme ones the longest; upper side glabrous, under glaucous and slightly pubescent: stipules linear-subulate, falcate: racemes axillary, corymbiform, long-peduncled, approximated at the ends of the branches, shorter than the leaves: flowers large, long-pedicelled, the pedicels subtended by an oblong-lanceolate acuminated bractea: petals unequal, the two lower smaller than the upper three: anthers all fertile, about equally long, the two lower on rather longer filaments: legumes drooping, linear, straight, thin, glabrous; margin slightly tumid.—*Heyne in Roth, nov. sp. p.* 213; *DC. prod.* 2. *p.* 496; *Spr. syst.* 2. *p.* 337; *Wall.! L. n.* 5311; *Wight! cat. n.* 652.—C. speciosa, *Roxb.! in E. I. C. mus. tab.* 1061.—Senna speciosa, *Roxb. fl. Ind.* 2. *p.* 347,

This species is found only in gardens; we have it also from St Vincent's: it scarcely differs from the last except in the rather smaller, narrower and

Digitized by Google

more numerous leaflets, and the decided inequality of the petals: may these differences arise from cultivation?

†897. (13) C. *fastigiata* (Vahl:) branches somewhat angled, glabrous: leaflets 8–9 pair, with a stalked gland between each pair, oblong-obtuse, slightly emarginate, minutely mucronate, glabrous, glaucous on the under side: peduncles angled, pubescent, approximated in the upper axils: flowers crowded towards the extremity of the peduncles; pedicels subtended by a lanceolate bractea: sepals densely pubescent.—*Vahl, symb.* 3. *p.* 57; *DC. prod.* 2. *p.* 496; *Spr. syst.* 2. *p.* 337.

We suspect that the glands may not have been so numerous as Vahl describes, and that this species is the same with *C. suffruticosa*, a species which was well known to Koenig, from whom Vahl received his specimens of *C. fastigiata*.

898. (14) C. *auriculata* (Linn.:) shrubby, erect: young branches, petioles and peduncles pubescent: leaflets 8–12 pair, with a subulate gland between each pair, oval, obtuse or retuse, mucronate; upper side glabrous, under slightly pubescent: stipules large, obliquely cordate, acute: racemes axillary, nearly as long as the leaves, many-flowered, approximated towards the ends of the branches; pedicels compressed: bracteas cordate-ovate, acuminated: sepals slightly hairy: legumes compressed, straight.—*Linn.! sp. p.* 542; *DC. prod.* 2. *p.* 496; *Spr. syst.* 2. *p.* 337; *Roxb. in E. I. C. mus. tab.* 638; *Wall.! L. n.* 5303; *Wight! cat. n.* 649.—Cassia, n. 151, *Linn.! fl. Zeyl.*—Senna auriculata, *Roxb. fl. Ind.* 2. *p.* 349.—*Pluk. t.* 314. *f.* 4.

A very common and handsome shrub, the bark of which is much used by the natives all over India for tanning leather.

++ Annual and herbaceous: petioles or rachis with one or more glands: legumes long, linear, tumid or 4-angled, pointed.

899. (15) C. *occidentalis* (Linn.:) annual, erect, branched, glabrous: leaflets 3–5 pair, without glands between them, ovate-lanceolate, very acute, glabrous on both sides: petiole with a large sessile obtuse gland near its tumid base: flowers longish pedicelled, upper ones forming a terminal raceme, lower ones 3–5 together on a very short axillary peduncle: lowest anther small and sterile: legumes long, when immature and dry compressed and surrounded with a tumid border, when ripe nearly cylindric or slightly compressed.—*Linn.! sp. p.* 539; *DC. prod.* 2. *p.* 497: *Spr. syst.* 2. *p.* 338; *Wight! cat. n.* 658.—C. Sophera, *Wall.! L. n.* 5317. *e, g, k, l, p.*—C. fœtida, *Roxb. in E. I. C. mus. tab.* 1419.—Senna occidentalis, *Roxb. fl. Ind.* 2. *p.* 343.

This is as much a native of the East as of the West Indies: it is found in almost every soil, but is particularly frequent in the neighbourhood of towns and villages among rubbish. The leaves when bruised exhale a very heavy disagreeable odour. In general habit, and in the structure of the leaves, the glands, and the stamens, this is so nearly allied to *C. Sophera*, that Dr Graham and Dr Wallich have united the two: the best mark lies in the position of the seeds. When the legumes are compressed, in which state they usually, if not always, appear in herbaria, this species has a narrow elevated rim surrounding them, which is not found in *C. Sophera*.

900. (16) C. *Tora* (Linn.:) annual, with spreading branches: leaflets 3 (or rarely 2) pair, with a cylindric gland between the 1–2 lower pair, but without any between the uppermost, cuneate-obovate, obtuse, glabrous, or pubescent on the under side: stipules subulate, nearly half the length of the petiole, deciduous: flowers long-pedicelled, upper ones forming a short terminal raceme, lower ones 1–2 together on a short axillary peduncle: upper petal obcordate: seven lower anthers about equal and fertile: legumes very long, sharp pointed, 4-sided, many-seeded; each suture 2-grooved.—*Wall.! L. n.* 5316; *Wight! cat. n.* 657.—C. obtusifolia, *Burm. Ind. p.* 95 (excl. syn.)—C. fœtida, *Sal. prod. p.* 326.—C. Gallinaria, *Collad. monogr. cass. p.* 96.

Digitized by Google

—Cassia, n. 152, *Linn.! fl. Zeyl.—Rumph. Amb. 5. t. 97. f. 2.*—α; diffuse, 1–2 feet high, two lower pair of leaflets each with a gland between them.—*Linn.! sp. p. 538; DC. l. c. p. 493; Spr. l. c. p. 339.*—Senna Tora, *Roxb. fl. Ind. 2. p. 340; Dill. Elth. t. 63. f. 73.*—β; stout, erect, 3–6 feet high; lower pair of leaflets only with a gland between them.—C. Tagera, *Lam. enc. meth. 1. p. 643* (not *Linn.*); *DC. l. c. p. 494; Spr. syst. 2. p. 340.*—C. toroides, *Roxb. in E. I. C. mus. tab. 1417.*—Senna toroides, *Roxb. fl. Ind. 2. p. 341.*—*Rheed. Mal. 2. t. 53.*

The figure in the Hort. Mal. is undoubtedly an accidental state of this plant, and hence we have referred above to *C. Tagera* of Lamarck, a species founded upon it. Lamarck doubts if the Linnæan plant be the same, and De Candolle and Colladon arrange it next the other under the name of *C. ciliaris*. It is, however, very distinct. *

§ 6. Absus, *DC.—Sepals a little obtuse or slightly acute. Petals nearly equal. Stamens 5–10, about equal, all fertile! Anthers with two clefts at the apex. Legumes flat-compressed, 1-celled or with imperfect partitions, dry, without pulp, few-seeded. Seeds vertical, ovate, compressed: podosperm short, scale-like.—Biennial or suffrutescent plants. Leaflets 2 pair. Upper flowers forming a short terminal raceme, the lower ones sometimes axillary and solitary. Pedicels minutely bracteolate about the middle.*

901. (17) C. *Absus* (Linn.:) biennial, all over clammy except the leaves: branches diffuse: leaves long-petioled; leaflets 2 pair, obovate, obtuse, glabrous, or slightly hairy on the under side: lower flowers axillary, solitary; upper ones forming a short raceme: pedicels short, with a bractea at their base, and minute bracteoles about the middle: stamens 5, all fertile: legume nearly straight, obliquely pointed, much compressed, sprinkled with rigid hairs, few-seeded.—*Linn.! sp. p. 537; DC. prod. 2. p. 500; Spr. syst. 2. p. 340; Wall.! L. n. 5314; Wight! cat. n. 656.*—C. viscosa, *Roxb. in E. I. C. mus. tab. 626.*—Cassia, n. 153, *Linn.! fl. Zeyl.*—Senna absus, *Roxb. fl. Ind. 2. p. 340.—Burm. Zeyl. t. 97; Pluk. t. 60. f. 1.*

§ 7. Chamæcrista, *DC.—Sepals acuminated, about equal. Stamens 10, or from abortion 4–7, all fertile. Anthers oblong, glabrous, 2-pored. Legume erect, linear, flat-compressed, dehiscent, several-seeded, destitute of pulp. Seeds vertical, compressed ovate or square.—Herbaceous or suffrutescent plants. Leaflets imbricated during night. Stipules many-nerved at the base. Flowers erect, pedicelled, 1–4 together on short somewhat axillary peduncles, or 1–4 together in the axils without peduncles: pedicels with 2 acute bracteoles.*

In the present section, (at least De Candolle's subdivision *Mimosoideæ*), we are not disposed to place any reliance on the size of the plant, or whether it be erect or diffuse, hairiness of the stems, or the number and shape of the leaflets, so that very few characters of a permanent nature remain: perhaps these are only to be looked for in the number and relative size of the stamens, and the shape and position of glands on the petiole: out of the 40 species, therefore, characterized by Colladon and De Candolle, there are probably not 10 essentially distinct: but it is almost im-

* *C. Tagera*, herb. Linn.!, is a slender branched straggling plant, the lower part of the branches being naked from the leaves having fallen off: leaves (towards the extremities of the branches) numerous, small; leaflets 2–3 pair, imbricating during night, very unequal-sided, strongly nerved and reticulated with veins; their margins, as well as the somewhat adnate cordate lanceolate membranous nerved stipules, are hairy: there is one erect pedicelled gland on the petiole: pedicels axillary, 2-bracteolate, 1-flowered, longer than the leaves: legumes small, erect, compressed, hairy. No habitat is attached. It is obvious, however, that this belongs to De Candolle's first division of *Chamæcrista*, called *Bauhinianæ*, all the species of which are found in America: perhaps *C. tenella*, K. B. K., may be the same. We infer that the leaflets imbricate during night (per somnum imbricantia), as in the specimens they are all so shut up.

Digitized by Google

possible to clear these up with any degree of satisfaction from the imperfect and often inaccurate descriptions given of the most important points.

902. (18) C. *Wallichiana* (DC.:) suffruticose, branched; branches long and nearly simple, diffuse or somewhat erect, old ones nearly glabrous, when young pubescent or hirsute: leaflets 20–50 pair (or near the root sometimes only 9–10 pair), with a sessile concave gland below the lowest pair, linear-oblong, very unequal sided and approaching to falcate, mucronate, nearly glabrous; rachis naked or very inconspicuously margined in the young leaves: stipules lanceolate-subulate from an obliquely cordate base: flowers supra-axillary, solitary or in pairs; pedicels in fruit 3–4 times longer than the petioles: stamens 10, alternately shorter: legume flat, linear, pointed, 14–20-seeded, constricted between the seeds, more or less hairy.—*DC. prod.* 2. *p.* 505; *Wall.! L. n.* 5320; *Wight! cat. n.* 639.—C. Leschenaultii, *Wall.! L. n.* 5325 (not *DC.*)—C. myriophylla, *Wall.! L. n.* 5326.

C. Telfairiana, Wall. L. n. 5224, approaches so very closely that it may prove to be only a variety; its habit is no doubt different, but the only specimens known are cultivated: we unfortunately did not examine, when we had the opportunity, the structure of its flower, but if a very similar species which we have from the Mauritius, sent by Mr Telfair to Dr Hooker, be the same, it may be distinguished by the three lower and the uppermost anthers being considerably longer than the other and intermediate six.

903. (19) C. *angustissima* (Lam.:) suffruticose, diffuse, procumbent, often much branched; branches pubescent or a little hairy: leaflets 20–60 pair, with a sessile concave gland below the lowest pair, usually minute, linear-oblong, unequal sided, mucronate, nearly glabrous or sprinkled with hairs; rachis of the young leaves furnished on its upper side with a crenated margin, and a short bristle in each crenature: stipules lanceolate-subulate from an obliquely cordate base: flowers supra-axillary, 1–2 together; pedicels in fruit about one-third of the length of the leaves: stamens 10, alternately shorter, the uppermost sometimes wanting: legumes flat, linear, mucronate, 15–20-seeded, constricted between the seeds, pubescent.—*Lam. enc. meth.* 1. *p.* 650; *DC. prod.* 2. *p.* 505; *Spr. syst.* 2. *p.* 343; *Wight! cat. n.* 641.—C. sensitiva, *Roxb. in E. I. C. mus. tab.* 640.—C. amœna, *Ham. in Wall.! L. n.* 5321.—C. Roxburghii, *Grah.! in Wall.! L. n.* 5323 (not *n.* 5308).—Senna sensitiva, *Roxb. fl. Ind.* 2. *p.* 353.—*Rumph. Amb.* 6. *t.* 67. *f.* 1; *Pluk. t.* 5. *f.* 2 (good).

If, as we suspect, luxuriant plants are occasionally erect, *C. tenella*, Roxb. in E. I. C. mus. tab. 1422, (*Senna tenella* of the fl. Ind.), may be added to the synonyms; and we have before us a specimen from Ceylon much more robust than any from the Peninsula, which tends to a suspicion that C. *angustissima* may be only a variety of *C. Wallichiana;* in which case the whole may be united with *C. mimusoides* of Linnæus! This last is erect and slender, about 2 feet high, nearly simple, with the stems pubescent; leaflets very numerous; pedicels much longer than the petioles; legumes slightly hairy. De Candolle's plant under the same name, with a stalked gland between the lower pair of leaflets, is very different; there is nothing in either the Linnæan specimen or description to allow of such a character.

904. (20) C. *pumila* (Lam.:) suffruticose, procumbent: branches a little hairy: leaflets 12–30 pair, with an erect slender-stalked peltate gland close to the lowest pair, linear-oblong, unequal sided, mucronate, more or less hairy or pubescent: rachis not margined: stipules lanceolate-subulate: flowers supra-axillary, 1–3 together; pedicels rather short: stamens 5, nearly equal: legumes flat, linear, 6–7-seeded, pubescent or nearly glabrous, constricted between the seeds.—*Lam. enc. meth.* 1. *p.* 651; *DC. prod.* 2. *p.* 504; *Spr. syst.* 2. *p.* 342; *Wall.! L. n.* 5327; *Wight! cat. n.* 636, 638, 640.—C. prostrata, *Roxb. in E. I. C. mus. tab.* 639.—Senna prostrata, *Roxb. fl. Ind.* 2. *p.* 352.—*Pluk. t.* 120. *f.* 1.

Digitized by Google

The peculiar gland and structure of the flower have induced us to unite these several numbers of Dr Wight's catalogue, and similar specimens have been already united by Dr Wallich: but there is as great a diversity of habit between them as between *C. angustissima* and *C. Wallichiana*. N. 638 and 640, and Wallich's n. 6327. *b, d,* correspond best with Roxburgh's drawing and description, and Plukenet's figure. The leaflets vary from much less than a line to a line and a half in breadth, and from 2 to 4 lines in length: the pedicels almost never exceed 3, or at most 4, lines. The Hindoos use the seed for their horses.

905. (21) C. *Kleinii* (W. & A.:) suffruticose, diffuse, procumbent; branches pubescent: leaflets 3–15 pair, with a stalked peltate small gland below the lowest pair, linear-oblong, unequal sided and somewhat falcate, mucronate, slightly pubescent: rachis not margined: stipules subulate: flowers supra-axillary, 1–2 together; pedicels a little shorter than the leaves: stamens 10, alternately shorter: legumes flat or more or less pubescent.—*Wight! cat. n.* 637.—C. dimidiata, *Klein!* (not *Ham.*); *Wall.! L. n.* 5328.—*Rheed. Mal.* 9. *t.* 21.——Travancore.

In the Peninsular specimens, the ovary is glabrous on the sides and villous on the sutures, and consequently the legume only pubescent on the margin: but we have before us undoubtedly the same species from Ceylon with the ovary all over villous. We are much inclined to refer De Candolle's *C. mimusoides* (not of Linn.) here, on the supposition that the term *erect* was borrowed from Linnæus, and that it is by an error of the press that the pedicels are said to be much *shorter* (instead of *longer*) than the petiole. This cannot be *C. dimidiata*, Don's prod., or *Senna dimidiata* of Roxb., in which there is a flat gland on the petiole, about 30 pair of leaflets, and only 4–5 stamens: nor is De Candolle correct in referring that plant to *C. Wallichiana*: it is however more probable that it and *C. Leschenaultiana*, DC., are the same.

LXXXVI. CYNOMETRA. *Linn.; Lam. ill. t.* 331; *Gært. fr.* 2. *t.* 156.

Calyx ebracteolate: tube very short: limb 4-partite, deciduous; the segments reflexed, upper one broadish, 2-nerved. Petals 5, oblong, lanceolate, equal. Stamens 10 or numerous, distinct, inserted with the petals into a short glandular ring lining the calyx-tube. Ovary nearly sessile, about 2-ovuled. Style erect. Stigma capitate. Legume nearly half-orbicular, thick, tumid, fleshy, scarcely dehiscent, 1-celled, 1-seeded. Seed filling up the cavity, attached to the middle of the suture. Embryo straight: cotyledons thick, roundish-cordate.—Trees. Leaves composed of 2–6 opposite leaflets. Flowers reddish, springing from the trunk or branches.

Sub-gen. 1. CYNOMETRA.—"Segments of the calyx tipped with a tuft of hairs. Stamens 10; anthers bifid at the apex." Legume tubercled and rugged on the outside.—Leaflets only one pair.

906. (1) C. *cauliflora* (Linn.:) leaflets oblong-lanceolate, acute or slightly emarginate: peduncles several, aggregated, springing from tubercles on the trunk, each bearing a raceme: stamens 10.—*Linn. sp. p.* 547; *DC. prod.* 2. *p.* 509; *Spr. syst.* 2. *p.* 327; *Lam. ill. t.* 331. *f.* 2; *Wall.! L. n.* 5816 (partly); *Wight! cat. n.* 632. *a.*—*Rumph. Amb.* 1. *t.* 62.——Near Madras; *Heyne (Wall.)*

907. (2) C. *ramiflora* (Linn:) peduncles solitary, few-flowered, springing from the branches among the leaves: stamens 10.—*Linn. sp. p.* 509.—*x*; leaflets oblong, acuminated.—*DC. prod.* 2. *p.* 509; *Spr. syst.* 2. *p.* 327.—*Rumph. Amb.* 1. *t.* 63.—*β*; leaflets oblong, emarginate.—*Wight! cat. n.* 632. *b.*

Digitized by Google

—C. ramiflora, *Lam. ill. t.* 331. *f.* 1.—C. cauliflora, *Wall.! L. n.* 5816. *c, d.*—*Rheed. Mal.* 4. *t.* 31.——Malabar.

Our specimens of both varieties are from Ceylon.

Sub-gen. 2. PSEUDOCYNOMETRA.—Calyx-segments naked at the apex. Stamens very numerous (40–60): anthers didymous, with a broad fleshy connectivum, dehiscing longitudinally along the margins. Legume smooth and even externally.—Leaflets 2–3 pair. Peduncles short, springing from axillary buds formed of densely imbricated ovate obtuse concave bracteas. Pedicels long and slender, corymbose.

*908. (3) C. *polyandra* (Roxb.:) leaflets 2–3 pair, oblong-lanceolate: flowers from the branches, axillary: stamens very numerous.—*Roxb. Cor.* 3. *t.* 286: *fl. Ind.* 2. *p.* 372; *DC. prod.* 2. 509; *Spr. syst.* 2. *p.* 327; *Wall.! L. n.* 5815; *Wight! cat. n.* 632. *c.*

Our specimens were obtained from Klein's herbarium, without any locality or name attached: it is perhaps not indigenous.

LXXXVII. BAUHINIA. *Linn.; Lam. ill. t.* 329.

Sepals 5, united into a calyx that is either 5-cleft, or split up on the lower side and spatha-like. Petals 5, spreading, oblong, slightly unequal. Anther-bearing stamens either 1 and distinct, with 9 monadelphous sterile filaments; or 3–5, with or without 1–7 sterile ones, all united at the base; or 10 without sterile ones, all slightly monadelphous at the base, or distinct: "sometimes there is a supernumerary or inner verticil (prolongation of the torus?) nearly entire, or more or less deeply cut into a greater or smaller number of short bristle-like threads." (*Graham*). Ovary stalked, containing 2 or more ovules. Style ascending, rarely wanting. Stigma capitate or dilated. Legume 1-celled, 2-valved, several- (rarely 1-) seeded. Seeds compressed, oval; inner seed-coat tumid. Embryo straight: radicle ovate: cotyledons flat. —Trees or shrubs. Leaves consisting of two opposite leaflets at the apex of the petiole; leaflets 2–5-nerved, either (very rarely) entirely distinct, or (usually) more or less united by their inner margins into a 2-lobed emarginate or entire leaf. Flowers racemose; racemes elongated, or corymbiform, simple, or panicled.

All the Indian species, which we have examined, have the stamens monadelphous at the base, although sometimes very shortly so, and never fewer than three of them with perfect anthers. De Candolle's first group *Casparia*, and his fifth *Caulotrepus*, may therefore be regarded entirely of American origin; the third *Symphyopoda*, and fourth *Phanera*, are, on the other hand, purely Asiatic; while the second *Pauletia*, contains a mixture from Asia, Africa, and America.

§ 1. *Filaments monadelphous (sometimes only very slightly so) at the base, 5 or 10 bearing anthers: ovary with the stalk free from the calyx-tube.*—Pauletia, *Cav.; DC.*

a. Calyx 5-cleft, regular: stamens 10, all fertile.

909. (1) B. *Malabarica* (Roxb.:) arboreous, unarmed: leaves transversely broad-oval, cordate at the base, glabrous; leaflets rounded, united considerably above the middle, parallel, 4-nerved: racemes axillary, corymbiform, almost sessile: calyx funnel-shaped, regular, 5-cleft, pubescent: corolla regular; petals spathulate: stamens 10, all fertile, very slightly monadelphous at their base, alternate ones shorter; "inner verticil wanting" (*Grah.*): ovary pubescent: legume long-stalked, linear, slightly falcate, at length glabrous, marked longitudinally with waved reticulating lines.—*Roxb. fl. Ind.* 2. *p.* 321; *Wall.! L. n.* 5793.——Malabar; *M. Brown, Esq.*

Digitized by Google

We have not seen the fruit; for the description of it, we are indebted to Dr Graham, who has undertaken the elaboration of Dr Wallich's *Leguminosæ*. Dr G. further informs us, that this plant has never borne fruit in the Calcutta Botanic Garden; that the fruit which he has seen is unripe, and was gathered at Gualpara in the month of September, and at Jiria in November, both by the late Dr Buchanan Hamilton, in 1808; that from the latter station being in the herbarium of the University of Edinburgh, the other in the magnificent collection presented by the Court of Directors of the East India Company to the Linnæan Society.

b. Calyx spathaceous: stamens 10, all fertile.

910. (2) B. *acuminata* (Linn.:) shrubby, large, erect, unarmed; leaves cordate at the base, young ones slightly pubescent on the under side, old ones glabrous: leaflets ovate, slightly acute or acuminated, united to above the middle, parallel, 4-nerved: racemes solitary, leaf-opposed or terminal, short, few-flowered: calyx spathaceous, much attenuated, splitting at the apex into 5 setaceous teeth: stamens 10, all fertile and united at the base, alternate ones shorter: legumes 8–12-seeded, obliquely linear-lanceolate, acuminated, the seminiferous suture with 3 prominent ribs.—*Linn. sp. p.* 536; *DC. prod.* 2. *p.* 513; *Spr. syst.* 2. *p.* 333; *Roxb. fl. Ind.* 2. *p.* 324; *in E. I. C. mus. tab.* 942; *Ham. in Linn. soc. trans.* 13. *p.* 498; *Wall! L. n.* 5794; *Wight! cat. n.* 631.—B. purpurea, *Wall. L. n.* 5797. *d* (according to Graham).—B. candida, *Ait.; DC. l. c.*—Bauhinia, n. 148, *Linn.! in herb. Herm.!; fl. Zeyl.—Rheed. Mal.* 1. *t.* 34.

De Candolle has by mistake inserted this in a section characterised by having only one fertile stamen: Rheede and other botanists describe it correctly. The leaves are sometimes scarcely at all acute, sometimes decidedly acuminated on the same bush. The flowers are pure white.

911. (3) B. *tomentosa* (Linn.:) shrubby, unarmed: branchlets, petioles, stipules, peduncles, calyx, legumes, and under surface of the leaves, shortly and softly villous: leaves roundish at the base; leaflets oval, obtuse, parallel, united to above the middle, 3-nerved: stipules setaceous: peduncles leaf-opposed, usually 2-flowered; pedicels each with 3 bracteas at the base: calyx spathaceous, ovate, shortly acuminated, 5-toothed: petals oval: stamens 10, all fertile and united at the base, ascending, upper ones gradually shorter: legume flat, lanceolate, 5–6-seeded.—*Linn. sp. p.* 536; *DC. prod.* 2. *p.* 514; *Spr. syst.* 2. *p.* 333; *Roxb. fl. Ind.* 2. *p.* 323; *in E. I. C. mus. tab.* 1552; *Wall.! L. n.* 5790; *Wight! cat. n.* 625.—Bauhinia, n. 147, *Linn.! in herb. Herm.!; fl. Zeyl.—Rheed. Mal.* 1. *t.* 35; *Burm. Zeyl. t.* 18. *bis*; *Pluk. t.* 44. *f.* 6.

912. (4) B. *racemosa* (Lam.:) arboreous, bushy, unarmed, with dark scabrous bark: branchlets drooping: leaves cordate at the base; upper side glabrous; under shortly villous, or pubescent, or nearly glabrous; leaflets roundish or broadly obovate, united to about the middle, 3-nerved: racemes solitary, terminal or leaf-opposed, leafless, much longer than the leaves; flowers scattered: calyx spathaceous, at length reflexed, 5-toothed, pubescent or shortly villous: petals linear-lanceolate, ascending, slightly hairy on the outside, upper ones gradually smaller: stamens 10, all fertile and united at the base, ascending, upper ones gradually shorter; filaments and anthers bearded with longish hairs: ovary glabrous, long-stalked; style none!; stigma, flat, sessile!: legumes linear, straightish or curved, woody, thick, scarcely dehiscent, many-seeded.—*Lam. encycl. meth.* 1. *p.* 390 (not of Vahl); *Wight! cat. n.* 626, 627.—B. parviflora, *Vahl, symb.* 3. *p.* 55; *DC. prod.* 2. *p.* 514; *Spr. syst.* 2. *p.* 333; *Roxb. fl. Ind.* 2. *p.* 323.—B. spicata, *Koen.; Roxb. in E. I. C. mus. tab.* 153; *Wall.! L. n.* 5789.

As Lamarck's description is exceedingly good, we restore the name originally given by him, and which was afterwards applied by Vahl, De Candolle, and others, to a very different species.

Digitized by Google

c. Calyx spathaceous: anther-bearing stamens 5, with or without fertile filaments between them.

913. (5) B. *variegata* (Linn.:) arboreous, unarmed: leaves roundish, cordate or rounded at the base, upper side glabrous, under when young shortly and softly villous afterwards glabrous; leaflets oval, obtuse, united far above the middle, nearly parallel, 5-nerved: racemes axillary and terminal: calyx spathaceous, ovate, slightly acuminated, 5-toothed at the apex: petals oblong, nearly sessile, the upper somewhat larger and on a rather longer claw than the others: fertile stamens 5, with sometimes the rudiments of 1–5 abortive filaments, all shortly united at the base; "inner verticil wanting" (*Grah.*); legume straight, linear, acuminated, compressed, gabrous, 5–12-seeded; seeds approximated.—*Wight! cat. n.* 630.—α; four petals reddish and veined with purple; the fifth variegated with purple, brown, and yellow.—*Ham. in Linn. soc. trans.* 13. *p.* 496.—B. variegata, *Linn. sp. p.* 535; *DC. prod.* 2. *p.* 514; *Spr. syst.* 2. *p.* 333; *Roxb. fl. Ind.* 2. *p.* 319; *in E. I. C. mus. tab.* 1238; *Wall.! L. n.* 5795.—B. purpurea, *Wall. L. n.* 5797, *e*, *i*? (partly), *k* (partly), *m*? (according to Graham).—*Rheed. Mal.* 1. *t.* 32.—β; four petals whitish; the fifth variegated on the inner side with yellow and green.—*Ham. l. c. p.* 497.—B. candida, *Roxb. fl. Ind.* 2. *p.* 318; *in E. I. C. mus. tab.* 634; *Wall. L. n.* 5796.

"This tree can only be said to differ from *B. candida* in the colour of the flowers: had I met with this first, I should certainly have considered the other as a variety only."—ROXB. We follow Hamilton in uniting them; in the herbarium it is impossible to distinguish the two.

§ 2. *Anther-bearing stamens* 3 (*or occasionally* 4), *or rarely* 5, *with or without* 2–7 *sterile filaments, all connected at the very base; ovary-stalk cohering on one side with the tube of the calyx.*—Symphyopoda, *DC.*

914. (6) B. *phœnicea* (Heyne:) arboreous?, unarmed, with a dark minutely warted bark: leaves ovate, cordate at the base, upper side glabrous, under minutely pubescent; leaflets united for about two-thirds of their length, obtuse, diverging, 3–4-nerved: panicles terminal, clothed with short dense tomentum; pedicels short with 3 bracteas at their base: calyx spathaceous: petals a little longer than the calyx, oblong-lanceolate, acute, nearly equal, glabrous, with claws about as long as the limb: stamens 5, all fertile; inner verticil cut into numerous bristle-shaped threads: ovary shortly tomentose.—*Heyne in Wall. L. n.* 5800.

We have taken the above character from a description of this plant sent us by Dr Graham. Dr G. remarks that the flower-buds are cylindric-clavate; the calyx 5-parted, the segments 1 inch long, linear, and generally united at the apex; whence we have considered it as a modification of spathaceous. It appears closely allied to the next, and principally differs by having 5 fertile stamens. May it not be a hybrid between *B. purpurea* and *B. variegata*?

915. (7) B. *purpurea* (Linn.:) arboreous, unarmed: leaves roundish, cordate at the base, coriaceous, glabrous; leaflets oval, obtuse, parallel, united to the middle or a little above it, the free portions sometimes overlapping each other, 4–5-nerved: racemes terminal, panicled: calyx usually cleft to the base of the limb into 2 reflexed segments, the one emarginate, the other 3-toothed, sometimes all cohering at the apex and spathaceous: petals oblong-lanceolate, attenuated at the base: fertile stamens 3 (or occasionally 4), long, ascending; "inner verticil large, thick, and slightly fimbriated on the edge" (*Grah.*): legume long, linear, pointed, with 6–12 rather distant seeds. —*Linn. sp. p.* 536; *Spr. syst.* 2. *p.* 333; *Roxb. fl. Ind.* 2. *p.* 320; *in E. I. C. mus. tab.* 635; *Ham. in Linn. soc. trans.* 13. *p.* 497: *Wall.! L. n.* 5797 (partly); *Wight! cat. n.* 629.—B. Coromandeliana, *DC. prod.* 2. *p.* 515.—*Rheed. Mal.* 1. *t.* 33.

De Candolle's *B. purpurea*, probably described from a specimen from the Island of Timor, is certainly different; we have never seen in our plant the

Digitized by Google

leaves covered underneath with reddish tomentum, nor the leaflets united far above the middle, this last appearance, in Rheede's plate, being caused by their overlapping each other a little, which they do not unfrequently.—We can scarcely distinguish *B. triandra* of Roxburgh; the petals are said to be obtuse, while in ours they are oftener acute, but there does not appear to be any other difference: in both they taper much towards the base *.

916. (8) B. *Vahlii* (W. & A.:) climbing to an immense extent: young shoots, petioles, peduncles, and tendrils, covered with a thick rusty-coloured tomentum: leaves roundish, deeply cordate at the base, upper side nearly glabrous, under tomentose; leaflets oval, obtuse, slightly diverging or nearly parallel, united to a little above the middle, 4–6-nerved, the nerves beneath covered with rusty tomentum: tendrils opposite, below the leaves, simple, spiral: racemes terminal, corymbiform; pedicels elongated, and with the calyx densely villous: calyx ovate, splitting to the base of the limb into 2 reflexed segments: petals cuneate-obovate, obtuse, densely clothed on the back (except towards the margins) with adpressed long silky hairs, the three upper a little larger than the others: fertile stamens 3, long, ascending, villous at the base, with 2–7 short sterile filaments: ovary densely villous, its stalk cohering on one side with the calyx-tube: style sparingly villous, slightly flexuose (much so during æstivation): stigma capitate: legume pendulous, long, linear, compressed, ligneous, shortly villous, 8–12-seeded.—*Wight! cat. n.* 628.—B. scandens, *Roxb. in E. I. C. mus. tab.* 53 (not of the *fl. Ind.*).—B. racemosa, *Vahl, symb.* 3. *p.* 56, *t.* 62 (not *Lam.*); *DC. prod.* 2. *p.* 515; *Spr. syst.* 2. *p.* 333; *Roxb. fl. Ind.* 2. *p.* 325; *Wall. L. n.* 5775.——Circars; *Roxburgh.*

Our own Indian specimens were obtained from the Missionaries' Garden, and are without flowers or fruit: and as we had not an opportunity of examining Dr Wallich's, we have described the flowers from a cultivated one in Mr Arnott's herbarium from the Mauritius, and taken the character of the legume from Roxburgh's fl. Indica †. The specimens seen by Vahl and by De Candolle appear to have been cut off above the tendrils, as they take no notice of that organ: every other particular, however, agrees well with our plant.—The branches are very extensive, from 100 to 300 feet long, climbing over the highest trees. Leaves often very large; we have one before us almost a foot and a half in diameter; those near the flowers are much smaller, sometimes not exceeding 3 inches across.

* "*B. triandra* is more slender, more flexuose, with more glaucous, oval, ovate, or obovate leaves, which are generally scarcely notched at the base, while in *B. purpurea* they are usually deeply cordate; the panicle, too, in *B. triandra* is more lax but less divaricated, and more slender; the petals, and especially their claws, are longer and narrower. But among the plants distributed by Dr Wallich, as well as in other herbaria, both forms are found under each name: thus one specimen I have of Wall. L. n. 5797. *h*, is identical with what I consider to be *B. triandra* represented by Wall. L. n. 5799. *b*, while another of the same letter is *B. purpurea*, to which I also refer Wall. L. n. 5797. *b*, *c*, *d* (partly), *f*, *h* (partly), and *l*. Between these extremes there are, however, some intermediate specimens; among which may be mentioned the specimen marked *B. triandra* in Roxburgh's own handwriting (Wall. L. n. 5799. *a*), and one under the same name from the Calcutta Bot. Garden in Wallich's collection, but not noticed in his List. As to the other letters under Wall. L. n. 5797, *e* is *B. variegata*; so is I suspect one specimen of *i*, but it is too imperfect for decision; another specimen under the same number and letter is more slender than those which I consider certainly *B. purpurea*, but it is probably this species, and is very like a specimen recently received from the Calcutta Bot. Garden as *B. purpurea*; *k* is a mixture of *B. variegata* and *emarginata*; *m* is very doubtfully *B. variegata*, but much too incomplete for determination. I have neither *a* nor *g*. In Hamilton's herbarium, now belonging to the University of Edinburgh, *B. triandra* (n. 1007) is composed of one specimen of the extreme form of the species, and another similar to Roxburgh's own: his n. 1008 is, I conceive, rightly named *B. purpurea*. In the catalogue of his herbarium, Hamilton says that he scarcely considers *B. purpurea* and *B. triandra* to be distinct except in the colour of the flower; and it is very probable that he may be right, particularly as I find the petals of both blunt, and the structure of the unripe legume and flower-bud alike. I have few perfect flowers, and no ripe fruit. Roxburgh calls the inflorescence of *B. triandra* a terminal or axillary raceme, and that of *B. purpurea* a terminal panicle: *B. triandra* often has a raceme, but occasionally a panicle, which however is larger and more branched in *B. purpurea*: in both the inflorescence is terminal or axillary towards the extremity of the branches."—*Graham in litt.*

† Since the above was written, Dr Graham has obligingly sent us a complete description of the plant from Indian specimens in his herbarium, which corroborates our own in every point. Dr Graham adds, that the corymbiform racemes are either terminal or by the elongation of the branches become opposite to the leaves; and in one specimen from the Calcutta Bot. Garden they are placed alternately upon an elongated terminal rachis.

Digitized by Google

§ 3. *Anther-bearing stamens* 3, *with or without several minute sterile filaments, all united at the very base: ovary-stalk free from the calyx-tube.*—Phanera, *Lour; DC.*

917. (9) B. *anguina* (Roxb.:) " climbing: stem compressed, flexuose; flexures approximated, regularly and alternately concave and convex on the two flat sides:" leaves glabrous, cordate; leaflets 3-nerved, half ovate, acuminated, united on young plants to the middle, on older ones to the apex: tendrils simple or bifid: racemes long, simple, many-flowered, forming a terminal panicle: flowers very small: calyx cup-shaped, obtusely 5-lobed!: petals obovate: stamens 3, all fertile: ovary glabrous, 2-ovuled, its stalk free from the calyx: legume oblong, glabrous, 1–2-seeded.—*Roxb. Cor.* 3. *t.* 285; *fl. Ind.* 2. *p.* 328; *DC. prod.* 2. *p.* 516; *Spr. syst.* 2. *p.* 333; *Wall.! L. n.* 5773. —B. piperifolia, *Roxb.? fl. Ind.* 2. *p.* 327.—*Rheed. Mal.* 8. *t.* 30, 31.——Birthour, Berkencour, and other places on the Malabar side; *Rheede.*

ORDER LVII.—ROSACEÆ. *Juss.*

Subord. 1. POTENTILLÆ. *Juss.*—Calyx 4–5- (or more-) divided: æstivation valvular. Petals as many as the lobes of the calyx, and alternating. Stamens indefinite, sometimes 10–15–20, rarely 5, and then alternate with the petals: anthers bilocular. Torus lining the tube of the calyx, sometimes becoming very fleshy: ovaria distinct, indefinite, or rarely definite (2–5): ovules suspended, erect or ascending, solitary, or rarely in pairs, one above the other: style lateral, attached near the apex: stigma simple or plumose. Fruit of small nuts or achenia. Seeds solitary. Albumen none. Embryo straight: radicle next the hilum: cotyledons flat.—Leaves alternate, often compound, stipulate.

I. RUBUS. *Linn.; Lam. ill. t.* 441.

Calyx flattish at the bottom, 5-cleft, without bracteoles. Petals 5. Stamens numerous inserted on the calyx along with the petals. Achenia numerous (rarely only 6), collected into a head on an evidently protuberant and spongy but not fleshy torus, at length becoming juicy and resembling little drupes. Styles slightly lateral from near the apex of the achenia. Seed inverted.—Shrubs, or rarely perennial herbaceous plants. Stems usually biennial, often rooting, sometimes unarmed but more generally prickly. Leaves petioled, sometimes pinnate or palmate, sometimes simple. Fruit eatable.

918. (1) R. *Wallichiania* (W. & A.:) stems somewhat terete, and the petioles and peduncles and pedicels armed with recurved prickles and densely hispid with brown horizontal hairs: leaves pinnately trifoliolate; leaflets nearly orbicular, toothed-serrated, green on both sides, glabrous above, slightly villous beneath; midrib and some of the larger nerves prickly beneath: stipules subulate: panicles large, compound, somewhat corymbose, axillary and terminal: segments of the calyx oblong-lanceolate, tomentose, hispid at the base: petals oblong, the length of the calyx.—*Wight! cat. n.* 1001.—R. hirtas, *Roxb. fl. Ind.* 2. *p.* 518 (not of *Weihe* and *Nees*).

919. (2) R. *gowreephul* (Roxb.:) stems somewhat terete, and the petioles and peduncles armed with recurved prickles and densely hispid with brown horizontal hairs: leaves pinnately trifoliolate; leaflets from elliptical to near-

Digitized by Google

ly orbicular, toothed-serrated, upper side glabrous, under white and tomentose with recurved prickles on the midrib and some of the nerves: stipules subulate: panicles small, axillary and terminal, corymbose: segments oblong, white and shortly tomentose on both sides: petals cuneate-obovate, twice as long as the calyx.—*Roxb. fl. Ind.* 2. *p.* 517; *Wight! cat. n.* 1002.—R. rotundifolius, *Wall. L. n.* 730.—R. paniculatus, *Moon? Ceyl. pl. p.* 40 (not *Roxb.*)

It is very closely allied to the last, but has the leaflets white beneath. We have a specimen before us from Ceylon.

920. (3) R. *lasiocarpus* (Sm.:) stems terete, long, rooting at the extremities, glabrous, glaucous, armed with curved prickles; branches and petioles tomentose and prickly: leaves pinnated; leaflets 3–7, somewhat plicate, from ovate or obovate and acuminated to lanceolate, terminal one roundish and often 3-lobed, glabrous above, white and tomentose beneath, irregularly toothed and serrated: stipules subulate: panicles racemose, chiefly terminal: segments of the calyx oblong, attenuated at the apex, tomentose: petals roundish, shorter than the calyx: carpels tomentose.—*Sm. in Rees' cycl.*; *DC. prod.* 2. *p.* 558; *Spr. syst.* 2. *p.* 527; *Wall.! L. n.* 742; *Wight! cat. n.* 1003. R. albescens, *Roxb. fl. Ind.* 2. *p.* 519.—R. racemosa, *Roxb. l. c.*—R. Mysorensis, *Heyne in Roth, nov. sp. p.* 235; *DC. prod.* 2. *p.* 557.—R. parvifolius, *Moon's Ceyl. pl. p.* 40.——Dindygul and Cunnawady hills. Mysore.

The figure in Rumph. Amb. 5. t. 47. f. 1. resembles this much in the foliage: it is usually referred to *R. parvifolius*, Linn., from which however it is certainly quite distinct; Roxburgh, in his manuscripts, suggests that it may be his *R. paniculatus* (in E. I. C. mus. tab. 1444), or *R. Roxburghianus*, Wall. L. n. 732.

921. (4) R. *rugosus* (Sm.:) shrubby, armed with scattered small straight or recurved prickles: branches, calyx, and under side of the leaves villous with a tawny tomentum: leaves simple, cordate, 3–5-lobed, reticulated and pitted underneath, scabrous and pustuled above: stipules and bracteas villous, cleft into several segments: racemes few-flowered, axillary and terminal: segments of the calyx oblong-lanceolate, equal to the corolla.—*Sm. in Rees' cycl.*; *DC. prod.* 2. *p.* 567; *Spr. syst.* 2. *p.* 531; *Wall.! L. n.* 748; *Wight! cat. n.* 1004.—R. alceæfolius, *Poir. encycl. meth.* 6. *p.* 247; *DC. l. c.*; *Spr. l. c.*—R. reflexus, *Ker, bot. reg. t.* 461; *DC. l. c. p.* 566; *Spr. l. c.*—R. Moluccanus, *Roxb. fl. Ind.* 2. *p.* 518 (not *Linn.*)—R. Hamiltonianus, *Ser. in DC. l. c.*

The lobes of the leaves are sometimes acute, sometimes obtuse: the segments of the calyx, though always described obtuse, are occasionally acute.

922. (5) R. *hexagynus* (Roxb.:) shrubby, armed with scattered compressed very short curved prickles: branches terete, tomentose: leaves oblong, more or less cordate at the base, serrated, villous on the nerves; midrib beneath and the petioles prickly: stipules and bracteas divided into filiform segments: flowers numerous, arranged in a long terminal panicle: calycine segments entire, lanceolate-subulate: petals linear, a little shorter than the calyx: styles 6: drupes about 3 or 4, obliquely ovate.—*Roxb. fl. Ind.* 2. *p.* 516; *Wall.! L. n.* 725.—R. Indicus, *Lesch. in DC. prod.* 2. *p.* 568.

II. FRAGARIA. *Linn.*

Calyx concave at the bottom, 5-cleft, with 5 bracteoles. Petals 5. Stamens numerous. Achenia juiceless, scattered on a fleshy and succulent polyphore or receptacle that at length separates from the conical central column. Style lateral. Seed suspended.—Herbaceous plants throwing out runners. Leaves trifoliolate: leaflets coarsely toothed. Receptacles or polyphores roundish, succulent, red or whitish.

Digitized by Google

§ 1. *Flowers white; receptacles eatable.*—Fragaria, *Sm.*

* 923. (1) F. *elatior* (Ehrh.:) leaflets somewhat coriaceous: hairs on the petioles, peduncles, pedicels and calyx widely spreading: calyx in fruit reflexed: bracteoles similar to the calycine segments.—*DC. prod.* 2. *p.* 570; *Spr. syst.* 2. *p.* 533; *Wight! cat. n.* 1005?——Neelgherries.

Our character is taken from British specimens; the Indian ones are much too imperfect to permit of our ascertaining their identity with sufficient accuracy; we are not aware that it is cultivated in the district.

§ 2. *Flowers yellow: receptacles insipid, not eatable.*—Duchesnea, *Sm.*

924. (2) F. *Indica* (Andr.:) leaflets obovate; peduncles axillary, solitary, 1-flowered: bracteoles patulous, cuneate, much larger and broader than the entire calycine segments, deeply 3–5-toothed at the apex.—*Andr. bot. rep. t.* 475; *DC. prod.* 2. *p.* 571; *Spr. syst.* 2. *p.* 533; *Wall. L. n.* 1236; *Wight! cat. n.* 1006.—F. Malayana, *Roxb. fl. Ind.* 2. *p.* 520.—Duchesnea fragarioides, *Sm.*—D. fragiformis, *Don.*—Potentilla Wallichiana, *Ser. in DC. prod.* 2. *p.* 574. ——Neelgherries.

We hesitate to quote here *F. Indica*, Roxb. (although Wallich and Lindley appear to consider it the same), the bracteoles being described and figured (in E. I. C. mus. tab. 1445) very differently. It belongs, however, to this section, and so does also, we believe, *F. Sundaiuca* of Blume, although in this last the bracteoles are entire as in the eatable species of the genus: both *F. Sundaiaca* and *F. Indica*, Roxb. (*F. Roxburyhii*, W. & A.), have occasionally the leaves 5-foliolate.

III. POTENTILLA. *Linn.*

Calyx concave at the bottom, 4–5-cleft, with 4–5-bracteoles. Petals 4–5. Stamens numerous. Achenia numerous, collected into a head on the flattish persistent dry receptacle. Style lateral. Seeds suspended.—Herbaceous or suffrutescent plants. Leaves compound. Stipules adnate to the petiole. Flowers white or yellow, rarely red.

925. (1) P. *Kleiniana* (W. & A.:) stems declinate, and petioles and peduncles hirsute: leaves palmately 5-foliolate; leaflets cuneate-oblong, rounded at the apex, crenate-toothed (the uppermost tooth equal to the others), nearly glabrous, except the nerves beneath which are clothed with silky hairs: stipules lanceolate, slightly acute, entire: flowers few, pedicellate, in a corymbose raceme sometimes afterwards becoming elongated: calycine segments oblong, a little obtuse: petals (yellow): achenia rugose.—*Wight! cat. n.* 1007.——Neelgherries.

Very closely allied indeed, both in appearance and character, to *P. verna*, *opaca*, and *alpestris*, of Europe.

926. (2) P. *supina* (Linn.:) stem herbaceous, decumbent, dichotomous, slightly villous: leaves pinnated; leaflets oblong, very slightly hairy, more or less incise-toothed: stipules lanceolate, entire: pedicels axillary, solitary: calycine segments and bracteoles lanceolate: petals (yellow) obovate, obtuse, not so long as the calyx: carpels rugose.—*Linn. sp. p.* 711; *DC. prod.* 2. *p.* 580; *Spr. syst.* 2. *p.* 535; *Wight! cat. n.* 1008.—P. Heynei, *Roth, nov. sp. p.* 235; *DC. prod.* 5. *p.* 580; *Spr. syst.* 2. *p.* 534; *Wall. L. n.* 1024.——Neelgherries.

We have no doubt that ours is the same as Roth's plant, and on the other hand we cannot find any constant character to separate it from *P. supina*, of which we possess specimens from the Caspian Steppes and Astrachan, as well as from Europe. It is also found in North America.

Digitized by Google

927. (3) P. *Leschenaultiana* (Ser.:) covered all over with silky long hairs: stems decumbent at the base: radical and lower leaves pinnated, longish-petioled; leaflets 5, cuneate-obovate, obtuse, incise-toothed, the lower pair smaller than the others: upper stem leaves palmately 3–5-foliolate; leaflets about equal and similar to the larger leaflets of the radicle leaves: stipules large, ovate-lanceolate; lower ones often entire; upper toothed or deeply cut: flowers in terminal forked panicles, or corymbose: calycine segments and bracteoles about equal, oblong-lanceolate, more or less obtuse: petals (yellow) slightly obcordate, about equal to the calyx: receptacle villous: carpels slightly wrinkled.—*α*; stems short; panicles small, corymbiform.—*Wight! cat. n.* 1009.—P. Leschenaultiana, *Ser. in DC. prod.* 2. *p.* 584.—*β*; stems elongated; panicles long, much forked.—P. Grahamiana, *Wight! cat. n.* 1010.——Neelgherries.

We are now disposed to regard our var. *β* as only a luxuriant variety of the other: but the general appearance is very different: it has the stems 2 or 3 feet long; whereas our *α* does not exceed 6 or 7 inches.

Subord. 2. Roseæ. *Juss.*—Calyx 5-divided, segments often pinnatisect; tube contracted at the mouth, at length fleshy: æstivation spirally imbricated. Petals 5. Stamens indefinite: anthers 2-celled. Torus thick, lining the tube of the calyx, bearing at its margin the stamens and petals, and on its surface the carpels. Ovaries superior, indefinite, concealed within the tube of the calyx: ovules in pairs, one above the other, suspended: styles persistent, lateral, attached near the apex of the ovary, protruded beyond the tube of the calyx, with their upper portions free or rarely concrete. Achenia numerous, hairy. Seed solitary. Albumen none. Embryo straight: radicle superior: cotyledons flat.—Shrubs. Leaves pinnate, rarely reduced to a simple leaflet, alternate, stipulate.

IV. ROSA. *Linn.; Lam. ill. t.* 440.

Character same as of the sub-order.

928. (1) R. (Systyla) *Leschenaultiana* (Red. & Thor.:) surculi very long, glabrous, glaucous, prickly; prickles about equal, hooked: petioles prickly, and peduncles and calyx-tube covered with gland-bearing bristles: leaflets 5–7, persistent, firmish, green and glabrous on both sides without glands, ovate-lanceolate, acutely simply or sometimes doubly serrated; midrib beneath glandular: stipules adnate: flowers nearly solitary: calyx-segments densely pubescent on both sides, nearly quite simple, at length reflexed: petals broadly obcordate: styles combined upwards into a thickish tomentose exserted column: fruit ovate.—*Wight! cat. n.* 1011.—R. sempervirens, *γ Ser. in DC. prod.* 2. *p.* 598.—R. Wallichii, *Sab. in Wall. L. n.* 687.

Several other species are before us, as *R. Indica* (Wall. L. n. 685), *R. moschata*, and *R. centifolia*, but they are cultivated, and not natives of the Peninsula.

Subord. 3. Pomaceæ. *Juss.*—Calyx 5-toothed, the odd segment superior: tube more or less globose, extremely fleshy and juicy. Petals 5, unguiculate. Stamens indefinite. Torus thin, lining the tube of the calyx, bearing the petals and stamens on its margin. Ovaria 1–5,

Digitized by Google

adhering to the side of the calyx: ovules ascending, in pairs and collateral, or rarely solitary: styles 1–5: stigmas simple. Fruit a pomum, 1–5-celled, or spuriously 10-celled: endocarp cartilaginous, spongy, or bony. Seeds solitary. Albumen none. Radicle short, next the hilum: cotyledons flat, or nearly convolute.—Trees or shrubs. Leaves alternate, stipulate.

Besides the following, Dr Wallich enumerates *Cotoneaster buxifolia*, Wall.! L. n. 661, from the Neelgherries: but this we have not seen.

V. PHOTINIA. *Lindl.*

Calyx 5-toothed. Petals reflexed. Ovary half-adhering, villous, 2-celled, 4-ovuled. Styles 2, glabrous. Pericarp bilocular (rarely from abortion unilocular and 1-seeded), inclosed within the fleshy calyx. Testa of the seeds cartilaginous.—Trees. Leaves simple, coriaceous, evergreen. Panicles corymbose, terminal. Fruit small.

929. (1) P. *Lindleyana* (W. & A.:) leaves elliptical or oblong-lanceolate, acute, serrulate or when young almost quite entire: panicles small, compound; ramifications glabrous: pedicels equal to the calyx: cells of the ovarium spuriously semibilocular: fruit glabrous, often 1-seeded from abortion. —α; leaves broadly elliptical.—*Wight! cat. n.* 1012.—β; leaves oblong-lanceolate.—*Wight! cat. n.* 1013.——Neelgherries.

930. (2) P. *Notoniana* (Wall.?:) leaves from cuneate-lanceolate to oblong, acute, quite entire or with a few inconspicuous scattered teeth: panicles large, very compound; ramifications puberulous: pedicels much shorter than the calyx: cells of the ovary spuriously semi-bilocular: fruit glabrous, 2-seeded.—*Wall.? L. n.* 671; *Wight! cat. n.* 1014.——Neelgherries.

We do not possess specimens from Dr Wallich, so that our reference is doubtful. The flowers of the present are much more numerous, but considerably smaller than those of *P. Lindleyana*.

VI. ERIOBOTRYA. *Lindl.*

Calyx woolly, obtusely 5-toothed. Petals bearded. Stamens erect, the length of the calycine teeth. Styles 5, filiform, included, hairy. Fruit a closed pomum, 3–5-celled. Chalaza none. Radicle inclosed between the base of the cotyledons.—Small trees. Branchlets tomentose. Leaves simple. Racemes compound, terminal, woolly. Bracteas subulate, deciduous.

* 931. (1) E. *Japonica* (Lindl.:) leaves lanceolate, somewhat cuneate at the base, slightly wrinkled, serrated, woolly on the under side: lobes of the calyx rounded.—*Lindl. in Linn. soc. trans.* 13. *p.* 102; *DC. prod.* 2. *p.* 631; *Wall.! L. n.* 666; *Wight! cat. n.* 1015.—Mespilus Japonica, *Thunb.; Spr. syst.* 2. *p.* 505; *Roxb. fl. Ind.* 2. *p.* 510; *in E. I. C. mus. tab.* 948.—Cratægus Bibas, *Lour.*—*Pluk. t.* 371. *f.* 2.

We believe that this is only found in a cultivated state in the Peninsula.

ORDER LVIII.—SALICARIEÆ. *Juss.*

Subord. 1. LYTHRARIEÆ. *Juss.*—Calyx tubular or campanulate, lobed, the lobes sometimes with intermediate accessory lobes or teeth: æstivation valvate. Petals alternate with the lobes of the calyx, very

Digitized by Google

deciduous, sometimes wanting. Stamens inserted a little below the petals, equal in number to them, or 2–3–4-times as many, rarely fewer: anthers introrse, bilocular, bursting longitudinally. Ovarium superior, 2–4-celled: ovules numerous: style usually filiform, rarely very short: stigma usually capitate. Placentæ in the axis. Capsule membranous, surrounded by but not combined with the calyx; usually 1-celled by the obliteration of the dissepiments, bursting longitudinally or irregularly. Seeds numerous, small. Albumen none. Embryo straight: radicle next the hilum: cotyledons flat and foliaceous.—Herbs, shrubs, or trees, with usually tetragonal branches. Leaves opposite or (seldom) alternate, entire, exstipulate, and without glands. Flowers bisexual.

TRIBE I.—LYTHREÆ.

Lobes of the calyx during æstivation more or less distant or somewhat valvate. Seeds wingless.—Shrubs or herbaceous plants.

I. ROTALA. *Linn.*

Calyx membranaceous, tubular, 3–5-lobed; lobes ovate, acute; sinus without accessory teeth. Petals obovate, minute, as long and as numerous as the calycine lobes. Stamens as many as the petals, inserted on the middle of the calyx-tube. Ovary 3-celled. Style very short. Stigma capitate. Capsule covered by the calyx, 1-celled, 3-valved, many-seeded. Seeds compressed, smooth and even, shining.—Small herbaceous plants. Leaves sessile, patulous. Flowers axillary, solitary, minute.

932. (1) R. *verticillaris* (Linn.:) leaves in verticils of 4–8, linear, acute: flowers sessile: seeds very numerous.—*Linn. mant. p.* 175; *DC. prod.* 3. *p.* 76; *Spr. syst.* 1. *p.* 180; *Wall.! L. n.* 6321; *Wight! cat. n.* 1016.—*Rheed. Mal.* 9. *t.* 81 (bad).

We have the authority of the Missionaries' and the Banksian herbarium for considering this to be the plant of the Mantissa and of Willdenow, although in the numerous flowers examined by us we have constantly found 5 lobes to the calyx and as many petals and stamens. We presume, therefore, that their number varies from 3 to 5. *R. mexicana,* Cham. and Schlecht., is described with 3 calycine teeth; *R. decussata,* DC., if indeed it belongs to the genus, has either 3 or 5 teeth, and no petals.

II. AMELETIA. *DC.*

Calyx campanulate-tubular, 4-cleft; the lobes ovate, very acute, converging; each sinus with a small tooth-like process. Petals none. Stamens 4, inserted on the tube of the calyx. Ovary ovate, 2-celled. Style filiform. Stigma capitate. Capsule ovate, 2-celled, 2-valved, septifragal, many-seeded.—Herbaceous creeping plants. Leaves opposite, obovate, nearly sessile. Floriferous branches axillary, forming small bracteated spikes. Flowers distinctly bibracteolated, sessile, solitary in the axils of the elongated bractæ.

933. (1) A. *Indica* (DC.:) spikes at length lax and 2–3 times the length of the leaves.—*DC. prod.* 3. *p.* 76; *Wall.! L. n.* 2093; *Wight! cat. n.* 1017. —Peplis Indica, *Willd. sp.* 2. *p.* 244.—Ammannia Indica, *Spr. syst.* 1. *p.* 244. —A. repens, *Rottl.!*; *DC. prod.* 3. *p.* p. 80.

Digitized by Google

A. polystachia, Wall. L. n. 2094, is only distinguishable by the spikes more crowded, and not exceeding the leaves: it is perhaps only a variety.

III. AMMANNIA. *Houst.; Lam. ill. t.* 77.

Calyx bracteolated at the base, more or less campanulate, 4–7-lobed, lobes flat or incurved, the sinus usually expanding into spreading accessory teeth or horns. Petals 4–5, or wanting. Stamens as many or twice as many as the calycine lobes. Ovary 2–3–4-celled. Style shortish or elongated. Stigma capitate. Capsule ovate-globose, membranaceous, either bursting transversely, the upper part falling away with the style, or opening by valves. Seeds numerous, attached to thick central placentas.—Herbaceous plants growing in wet soil or in water, all nearly quite glabrous. Stems 4-angled or occasionally terete when old. Leaves opposite, quite entire. Flowers axillary, sessile, or shortly peduncled, bracteolated at the base.

This genus ought either to be divided into genera, or into sections on a different principle from that adopted by authors. The genus or subgenus with 4 stamens, a 4-celled ovary, and accessory teeth to the calyx, which ought to be viewed as the type of *Ammannia*, does not occur in India. Our first subgenus ought perhaps to be removed to *Nesæa*, from which it only differs by the bracteoles at the base of the calyx.

Sub-gen. 1. Calyx campanulate, shortly 4–7-lobed; accessory horns conspicuous and rather longer than the lobes. Petals 4–7. Stamens twice as many as the petals. Ovary 4–5-celled. Style filiform.—*Diplostemon*, DC.

934. (1) A. *octandra* (Linn.:) leaves linear-lanceolate, sessile, acutely auricled at the base: peduncles axillary, very short, 1–3-flowered: calyx 4-angled; the angles slightly winged and scabrous, running out into the patent accessory horns: petals 4: stamens 8, as long as the corolla: capsule 4-celled, the dissepiments usually remaining entire.—*DC. prod.* 3. *p.* 80; *Spr. syst.* 1. *p.* 444; *Roxb. Cor.* 2. *t.* 133; *fl. Ind.* 1. *p.* 425; (*ed Wall.*) 1. *p.* 446; *Wall.! L. n.* 2097; *Wight! cat. n.* 1018.—A. coccinea, *Pers.*

Subgen. 2. Calyx campanulate, shortly 4–5-lobed; lobes broadly triangular or rounded; accessory horns conspicuous, and longer than the lobes. Stamens 4–5, included. Ovary 2-celled. Style short, not so long as the ovary. Capsule included, 1-celled, opening transversely.—Flowers axillary somewhat sessile.—*Ditheca.*

935. (2) A. *verticillata* (Lam.:) leaves lanceolate, attenuated at the base: flowers almost sessile, 2–3 in the axils of the opposite leaves: calyx half-globose: petals 4–5, obovate.—*Lam. ill. t.* 77. *f.* 3; *DC. prod.* 3. *p.* 79.—A. Caspica, *Marsch. Bieb.; DC. prod.* 3. *p.* 78 (partly).—A. lanceolata, *Heyne in Wall.! L. n.* 2106.—α; calyx glabrous or nearly so.—*Wight! cat. n.* 1019, 1096.—*Pluk. t.* 356. *f.* 6.—β; leaves on the margin, upper part of the calyx, and accessory horns hispid with short hairs.—*Wight! cat. n.* 1020.

Very closely allied to *A. Ægyptica*, Willd. (from which *A. Caspica* of Ledebour and several of the Russian botanists does not appear to be distinct) but differs by having petals. The stems, as in the other species, vary from simple to several times branched.

936. (8) A. *cordata* (Wight:) leaves oblong, upper ones cordate at the base, sessile: flowers sessile, 2–3 in the axils of the leaves: calyx half-globose: petals 4, obovate.—*Wall.! L. n.* 6322; *Wight! cat. n.* 1021.

In all the specimens we have seen each pair of leaves is at a considerable

Digitized by Google

distance from the next pair; the stem is nearly simple, and the root does not seem to creep: we are therefore doubtful if *A. densiflora* be the same or not.

† 937. (4) A. *densiflora* (Roth:) stems ascending, branched, creeping at the base: leaves sessile, linear-lanceolate, rather cordate at the base: branches all densely beset with flowers from the base so as to appear spiked: floral leaves recurved: flowers axillary, sessile: petals 5, obovate.—*Roth, nov. sp. p.* 99; *DC. prod.* 3. *p.* 79.

Subgen. 3. Calyx 4-cleft to the middle; lobes triangular, acute; accessory teeth minute, little more than mere callous points. Stamens 4, scarcely exceeding the segments of the calyx. Ovary 2-celled. Capsule longer than the calyx, 1-celled, bursting transversely and irregularly.—Flowers minute.—*Hapalocarpum.*

938. (5) A. *glauca* (Wall.:) leaves glaucous, linear-oblong; floral ones reflexed: flowers numerous in the axils of the leaves, forming a dense sessile verticil: calyx cup-shaped: petals wanting: style short.—*Wall.! L. n.* 2100: *Wight! cat. n.* 1022.

939. (6) A. *vesicatoria* (Roxb.:) stem much branched: leaves lanceolate, attenuated towards the base: flowers very minute, aggregated in the axils of the leaves, almost sessile: calyx-tube at first narrow and tightened round the ovary, in fruit cup-shaped; limb much wider than the tube: petals wanting: style short.—*Roxb. fl. Ind.* 1. *p.* 426; (*ed Wall.*) 1. *p.* 447; *in E. I. C. mus. tab.* 35; *DC. prod.* 3. *p.* 78; *Spr. syst.* 1. *p.* 444; *Wall.! L. n.* 2098; *Wight! cat. n.* 1023.

The above character is from what we consider the type of the species, but it must be confessed that sometimes the pedicels become elongated, and form a small corymb, when it is impossible to distinguish it satisfactorily from the next species.

940. (7) A. *Indica* (Lam.:) leaves lanceolate, attenuated towards the base: flowers very minute, in axillary short peduncled lax corymbs, petals wanting: style short.—*DC. prod.* 3. *p.* 77; *Wall.! L. n.* 2099; *Wight! cat. n.* 1024.

Perhaps *A. baccifera* of Linnæus ought to be referred here. The figure given by Burmann (fl. Ind. t. 15. f. 3, 4) is probably from small specimens, of which we have some before us agreeing very well with the figure as to size; but Burmann has represented the flowers in sessile dense; verticels as in *A. vesicatoria.* It is difficult to say what *A. baccifera* of Roth is.

941. (8) A. *multiflora* (Roxb.:) leaves linear, auricled at the base, sessile: peduncles axillary, with the pedicels about as long as the floral leaves, 1–7- (usually 3-) flowered: flowers minute: calyx-tube at first narrow, afterwards cup-shaped: petals 4, roundish: style filiform, as long as the ovary.—*Roxb. fl. Ind.* 1. *p.* 426; (*ed Wall.*) 1. *p.* 447; *in E. I. C. mus. tab.* 95; *DC. prod.* 3. *p.* 79; *Spr. syst.* 1. *p.* 444; *Wall.! L. n.* 2101; *Wight! cat. n.* 1025.

Subgen. 4. Calyx campanulate, 5-cleft: lobes triangular: sinus with a subulate accessory process. Petals 5. Stamens 5, the length of the calyx. Ovary 3-celled. Style shortish, filiform. Capsule 3-valved, imperfectly 3-celled, septifragal.—Flowers minute, with two subulate bracteoles as long as the calyx.—*Tritheca.*

942. (9) A. *pentandra* (Roxb.:) leaves from linear-lanceolate to linear-oblong: flowers axillary, solitary, sessile: petals 5, twice the length of the calycine segments, obovate, sometimes entire but usually emarginate or 3-toothed.—*Roxb. fl. Ind.* 1. *p.* 427; (*ed Wall.*) 1. *p.* 448; *in E. I. C. mus. tab.* 448; *DC. prod.* 3. *p.* 79; *Spr. syst.* 1. *p.* 444.—A. nana, *Roxb. fl. Ind.* 1. *p.* 427; (*ed Wall.*) 1. p. 448; *in E. I. C. mus. tab.* 549; *DC. l. c.; Spr. l. c. p.*

Digitized by Google

445; *Wall.! L. n.* 2105.—A. rubra, *Wall. L. n.* 2107 (at least as to the Peninsular specimens).—α; leaves acutish at the base.—*Wight! cat. n.* 1026.—A. rosea, *Poir.? encycl. meth. suppl.* 1. *p.* 329; *DC.? l. c. p.* 80.—Sellowia uliginosa, *Roth? nov. sp. p.* 163; *DC. prod.* 3. *p.* 380.—Winterlia uliginosa, *Spr.? syst.* 1. *p.* 788.—β; leaves broadish and somewhat auricled at the base. —*Wight! cat. n.* 1027.

That neither the size nor the mode of branching noticed by Roxburgh is of any consequence is obvious from the numerous specimens before us. Dr Wallich's *A. pentandra* (L. n. 2102) we have not seen: it is, however, from Bengal, and is perhaps distinct from ours which is the same with Roxburgh's according to his description and drawing; no specimens of it were in Roxburgh's herbarium, from which we may suspect that he himself could not distinguish it from his *A. nana*, of which there are specimens. De Candolle translates 'cuneate' in *A. nana* by 'sagittatis,' an evident mistake, as he had not seen specimens. *Sellowia* of Roth (*Winterlia* of Sprengel) we have little doubt was described from small plants of this species, and that Roth has been led into an error when he describes the capsule as 1-seeded, mistaking, perhaps, the persistent central placenta for a seed: the placenta is, however, 3-winged (from the remains of the dissepiments), not ovate and shining as he states of the seeds.

Subgen. 5. Calyx petaloid, campanulate, 4-cleft to the middle: segments triangular-ovate, with no accessory teeth. Petals 4, obovate, twice as long as the lobes of the calyx. Stamens 4. Ovary broadly obovoid, 4-lobed, 4-celled. Style about as long as the ovary. Capsule at length 1-celled.—Flowers largish, arranged in bracteated somewhat imbricated spikes, solitary in the axil of each bractea, shortly pedicellate; the pedicel connate with the petiole of the bractea. Bracteas cordate ovate, shortly petioled.—*Mirbeoa.*

943. (10) A. *rotundifolia* (Buch. Ham.:) leaves orbicular or broadly obovate, nearly sessile.—*Roxb. fl. Ind.* 1. *p.* 425; (*ed Wall.*) 1. *p.* 446; *in E. I. C. mus. tab.* 1344; *DC. prod.* 3. *p.* 79; *Spr. syst.* 1. *p.* 443; *Wall.! L. n.* 2095; *Wight! cat. n.* 1028.——Neelgherries.

In Wallich's List (n. 2096) there is a species, *A. latifolia*, Wall. (not of Linnæus, and therefore the name must be changed), said to be allied to the present one: we have not seen it.

Species scarcely known.

† 944. (11) A. *parviflora* (DC.:) "stem erect, 4-angled, glabrous; leaves oblong sessile: cymes axillary, several-flowered, longer than the leaves: calyx 4-toothed: capsule globose, scarcely longer than the calyx."—*DC. prod.* 3. *p.* 77.

Neither the petals nor stamens have been observed: it is probably the same with *A. multiflora*, Roxb.

† 945. (12) A. *Heyneana* (Wall.)—*Wall. L. n.* 2104.—A. pentandra, *herb Heyne* (not *Roxb.*, according to Wallich).

IV. PEMPHIS. *Forst. gen. t.* 34.

Calyx turbinate, persistent, 12-furrowed, with 6 larger erect lobes, and 6 smaller lobe-shaped alternating spreading sinuses. Petals 6, obovate, inserted into the top of the calycine-tube, and alternating with the larger or true lobes of the calyx. Stamens 12, inserted on the middle of the calyx, alternately smaller. Ovary globose, 3-celled. Style short. Stigma capitate. Capsule filling up the calyx, membranaceous, 6-valved, 3-celled at the base, opening horizontally. Seeds numerous, attached to a central 3-toothed pla-

Digitized by Google

centa.—Canescent shrubs. Leaves opposite, quite entire. Pedicels axillary, solitary, bibracteolated at the base. Flowers white.

946. (1) P. *acidula* (Forst.)—*DC. prod. p.* 89; *Wall.! L. n.* 2108; *Wight! cat. n.* 1029.—P. angustifolia, *Roxb. fl. Ind.* 2. *p.* 465.—Lythrum Pemphis, *Linn. f. suppl. p.* 249; *Lam. ill. t.* 408. *f.* 2.—Melanium fruticosum, *Spr. syst.* 2. *p.* 455.—*Rumph. Amb.* 3. *t.* 84.

V. NESÆA. *Comm.*

Calyx hemispherical-campanulate, not bracteolated at the base, with 4–6 erect lobes, and as many alternating horn-shaped patent sinuses. Petals 4–6, alternate with the erect lobes. Stamens 8–12, somewhat equal. Ovary sessile, nearly globose, 4-celled. Style long, filiform. Stigma capitate. Capsule included within the calyx. Seeds numerous, minute.—Glabrous herbaceous plants. Leaves lanceolate-oblong, nearly sessile, obtuse or acute. Peduncles longish, 3-flowered at the apex, with 2 larger bracteas and 4 minute ones at the origin of the pedicels.

* 947. (1) N. *triflora* (Kunth.)—*DC. prod.* 3. *p.* 90; *Spr. syst.* 2. *p.* 455; *Wight! cat. n.* 1030.—Lythrum triflorum, *Linn.*—Ammannia triflora, *Wall.! L. n.* 6323.

We are uncertain where the specimens before us were procured: probably they were obtained from the Madras herbarium, in which case Dr Wallich mentions them as coming from the Mauritius.

VI. LAWSONIA. *Linn.; Lam. ill. t.* 296. *f.* 1.—Alcanua. *Gærtn. fr. t.* 110.

Calyx 4-partite, spreading, persistent, the sinuses not produced into teeth or lobes. Petals 4, alternate with the lobes of the calyx, obovate, unguiculate, spreading. Stamens 8, placed together in pairs that alternate with the petals. Ovary sessile, 4- (or occasionally 3-) celled. Style long, filiform. Stigma capitate. Capsule globose, membranaceous, much larger than the calyx, scarcely dehiscent, 3–4-celled. Seeds numerous, angled, attached to central placentæ.—Glabrous shrubs. Leaves opposite, quite entire. Flowers panicled or corymbose, white.

The description given by Loureiro of his *L. falcata* is quite at variance with this genus: the figure he refers to in Rumphius (6. t. 25. f. 1) represents apparently a species of *Solanum* ("the common *Solanum* of India, usually taken for the *S. verbascifolium*, which is an American plant, and probably different from ours." HAM. *mss.*)

948. (I) L. *alba* (Lam.:) leaves oval-lanceolate, quite entire, glabrous: flowers panicled.—*DC. prod.* 3. *p.* 90; *Spr. syst.* 2. *p.* 217; *Wall.! L. n.* 2109; *Wight! cat. n.* 1031.—L. spinosa, *Linn.*—L. inermis, *Linn.; Roxb. fl. Ind.* 2. *p.* 258; *in E. I. C. mus. tab.* 627.—*Rheed. Mal.* 1. *t.* 40; *Rumph. Amb.* 4. *t.* 17.

"The species called *spinosa* is nothing more, I imagine, than the same plant growing on a dry sterile soil: at least in such soils I have often found it very thorny, the branchlets being then short and rigid, with sharp thorny points." ROXB.—*L. spinosa* of Loureiro is perhaps distinct, although he refers to the above figure in Rumphius: he describes the leaves as small and somewhat tomentose, and the capsule very small.

VII. GRISLEA. *Læfl.; Linn.*—Woodfordia. *Sal.*

Calyx coloured, tubular, with 4–6 erect teeth, and as many smaller horn-shaped sinuses. Petals 4–6, inserted on the top of the tube of the calyx be-

Digitized by Google

tween the true teeth, linear or oblong, unguiculate. Stamens twice as many as the petals, protruded, inserted into the base of the calyx. Ovarium sessile, 2-celled. Style filiform, protruded. Stigma bifid. Capsule 2-celled, 2-valved, included within the calyx. Seeds very numerous, attached to thick central placentas.—Shrubs. Leaves opposite, quite entire, under side dotted with black scattered glands. Peduncles axillary, several-flowered. Flowers red.

949. (1) G. *tomentosa* (Roxb.:) branchlets pubescent: leaves lanceolate, somewhat cordate at the base, sessile, under side hoary, upper more or less glabrous: petals usually 6: stamens declinate, usually 12: capsule oblong.—*Roxb. Cor.* 1. *t.* 31; *fl. Ind.* 2. *p.* 233; *DC. prod.* 3. *p.* 92; *Spr. syst.* 2. *p.* 216; *Wall.! L. n.* 2110; *Wight! cat. n.* 1032.—Lythrum fruticosum, *Linn. sp. p.* 641; *Roxb. in E. I. C. mus. tab.* 653 (good).

† 950. (2) G. *punctata* (Ham.:) branches and flowers erect: leaves petioled, lanceolate, glabrous: calyx 4 times longer than broad: petals 6: stamens 12.—*Sm. in Rees' cycl. n.* 2.

We suspect this to be a variety of the former.

TRIBE II.—LAGERSTRŒMIEÆ. *DC.*

Lobes of the calyx exactly valvular during æstivation. Seeds expanded into a membranaceous wing.—Shrubs or trees.

VIII. LAGERSTRŒMIA. *Linn.*

Calyx bibracteolated at the base, 6-cleft; lobes distinct; sinuses rounded. Petals 6, unguiculate. Stamens 18–30. Capsule surrounded below by the persistent calyx, 3–6-valved, 3–6-celled.—Trees or shrubs. Branches quadrangular. Leaves opposite, quite entire. Peduncles axillary, often forming a panicle or raceme towards the ends of the branches. Flowers purple or white.

* 951. (1) L. *Indica* (Linn.:) leaves elliptical or ovate, glabrous, paler beneath: panicle many-flowered, terminal: calyx even (neither plicate nor furrowed): petals with long claws, much curled: the six outer stamens longer and thicker than the others: capsule globose, 5–6-celled.—*DC. prod.* 3. *p.* 93; *Spr. syst.* 2. *p.* 603; *Roxb. fl. Ind.* 2. *p.* 505; *in E. I. C. mus. tab.* 30; *Wall.! L. n.* 2118; *Wight! cat. n.* 1033.—Velaga globosa, *Gærtn. fr.* 1. *t.* 133.—*Rumph. Amb.* 7. *t.* 28.

952. (2) L. *parviflora* (Roxb.:) leaves from oblong or oval and obtuse to ovate and acute, pale beneath: pedúncles axillary, 3–6-flowered: calyx even: petals flattish, shortly unguiculate: the 6 outer stamens longer than the others: capsule oblong, 3–4-celled.—*α*; under side of the leaves downy.—*Wight! cat. n.* 1034.—L. parviflora, *Roxb.! Cor.* 1. *p.* 48. *t.* 66; *fl. Ind.* 2. *p.* 505; *DC. prod.* 3. *p.* 93; *Spr. syst.* 2. *p.* 603; *Wall.! L. n.* 2119 (partly).—*β*; under side of the leaves glabrous.—*Wight! cat. n.* 1035.—L. parviflora, *Wall.! L. n.* 2119. *g, h.*——*α*; Circars.—*β*; Courtallum. Neelgherries.

953. (3) L. *Reginæ* (Roxb.:) leaves oblong, glabrous: panicle terminal: calyx tomentose, longitudinally furrowed and plaited: petals orbicular, waved, shortly unguiculate: stamens all about equal, broadly ovoid, 6-celled.—*Roxb. Cor.* 1. *p.* 46. *t.* 65; *fl. Ind.* 2. *p.* 505; *DC. prod.* 3. *p.* 93; *Spr. syst.* 2. *p.* 603; *Wall. L. n.* 2114; *Wight! cat. n.* 1036.—L. flos-regina, *Retz, obs.* 1. *p.* 20, *and* 5. *p.* 25.—Adambea glabra, *Lam. enc. meth.* 1. *p.* 39.—*Rheed. Mal.* 4. *t.* 20, 21.——Circars. Courtallum. Malabar.

† 954. (4) L. *hirsuta* (Willd.:) leaves oblong, pubescent: panicle corym-

Digitized by Google

bose, terminal: calyx longitudinally furrowed and plaited.—*Willd. sp.* 2. *p.* 1178; *DC. prod.* 3. *p.* 93; *Spr. syst.* 2. *p.* 603.—Adambea hirsuta, *Lam. enc. meth.* 1. *p.* 39.—*Rheed. Mal.* 4. *t.* 22.—Mountainous places in Mala and Poiga, provinces of Malabar.

This has hitherto been only seen by Rheede, and known by his figure and description; Lamarck, and following him, Willdenow and De Candolle, have, from trusting to the figure, described it with oval flat petals: Rheede, however, states the flowers to be the same as in *L. Reginæ*, and we suspect the flat petal-like bodies to be an exaggerated representation of the calycine segments. De Candolle, further, places it among those with the stamens equal, and if he be correct there would be no character except the pubescence, which is insufficient of itself, to distinguish it from *L. Reginæ*: but Rheede says that it differs by having 5 stamens, probably meaning that some are longer than the others.

† 955. (5) L. *lanceolata* (Wall.) — *Wall. L. n.* 2120. —— Courtallum; *Heyne.*

Perhaps this is the same with *L. parviflora* β: at the same time, there is the fragment of a specimen in Dr Wight's collection (Wight! cat. n. 1037) with the habit of *L. parviflora* β, but with the fruit about as large as that of *L. Reginæ*, which may possibly be the same as Heyne's plant.

Subord. 2. CERATOPHYLLEÆ. *Gray.*—**Calyx 10–12-partite, lobes equal. Petals none. Stamens 12–20: anthers ovato-oblong, bilocular, bicuspidate, sessile. Ovarium free, ovate, 1-celled: ovule solitary, pendulous: style filiform, oblique: stigma simple. Nut 1-celled, indehiscent, terminated by the indurated style. Seed solitary, pendulous. Albumen none. Embryo straight: radicle superior; cotyledons deeply bipartite, one of the segments smaller, resembling 4 unequal cotyledons—Aquatic herbs. Leaves verticillate, cut into filiform lobes. Flowers uni-sexual.**

Much as this suborder differs in appearance from the former, we have the authority of Richard for uniting them. It must be confessed, however, that their chief great resemblance lies in the persistent calyx, free from but surrounding the fruit.

IX. CERATOPHYLLUM. *Linn.; Gærtn. fr.* 1. *t.* 44; *Lam. ill. t.* 775.

Character the same as of the suborder.

956. (1) C. *muricatum* (Cham.:) fruit elliptical, slightly compressed, furnished with 3 (or occasionally 4) spines, winged, not gibbous; spines slender, weak; wing narrow, regularly many-toothed; sides of the fruit convex, more or less muricated, particularly towards the apex.—*Cham. in Linnæa*, 4. *p.* 504. *t.* 5. *f.* 6. *c*; *G. Don, in Mill. dict.* 3. *p.* 706; *Wight! cat. n.* 1038.

We can see no difference between the Indian specimens and the Egyptian ones described by Chamisso, except that the latter appear to have the fruit a little more compressed, and its sides less convex. In ours we perceive occasionally 4 spines, in which case 2 of them are terminal.

957. (2) C. *tuberculatum* (Cham.:) fruit ellipsoidal, slightly compressed, not gibbous, furnished with 3 spines, wingless; spines at first slender and weak, afterwards strong; sides of the fruit convex, finely tubercled.—*Cham. in Linnæa*, 4. *p.* 504. *t.* 5. *f.* 6. *d*; *G. Don, in Mill. dict.* 2. *p.* 706; *Wight! cat. n.* 1039.—C. Indicum, *herb. Willd. n.* 17546.—C. demersum, *herb. Klein* (partly); *Wall.! L. n.* 7007 (partly).—C. Missionis, *Wall. l. c.* (partly).—C. verticillatum, *Roxb.? hort. Bengh. p.* 68; *fl. Ind.* 3. *p.* 624.

Digitized by Google

958. (3) C. *Missionis* (Wall.:) fruit ellipsoidal, slightly compressed, not gibbous, furnished with 3 spines, winged; spines elongated, lateral ones flattened; the wing broader downwards and decurrent along the base of the spines, with a few irregular teeth: sides of the fruit convex, finely tubercled. —*Wall.! L. n.* 7007 (partly); *Wight! cat. n.* 1040.—C. demersum, *herb. Klein!*—Myriophyllum Indicum, *Wall.! L. n.* 6338. *c.*

This and the last do not appear to have been distinguished by the Missionaries: at least the specimen sent by Klein to Willdenow belongs to the one, while those from his (or the Madras) herbarium before us have the fruit of the present species: except in the presence or absence of the wing there is, however, no difference, and we have merely separated them in deference to Chamisso's observations on the genus. Perhaps the whole three species ought to be combined as varieties under Roxburgh's name of C. *verticillatum*, characterized as a species by the ellipsoidal tubercled or muricated 3-spined not gibbous fruit.

ORDER LIX.—RHIZOPHOREÆ. *R. Brown.*

Calyx 4–13-lobed: æstivation valvate, or sometimes calyptriform. Petals inserted on the calyx, alternate with the lobes, and equal to them in number. Stamens inserted with the petals, twice or several times as many: filaments distinct: anthers erect, straight, or incurved. Ovarium adherent to the calyx, 2-celled, or 1-celled with a central columella: ovules 2 in each cell, or several when 1-celled, pendulous. Fruit indehiscent, 1-celled. Seed pendulous, solitary. Albumen none. Radicle long: cotyledons flat.—Trees or shrubs. Leaves simple, opposite, with stipules between the petioles.

I. RHIZOPHORA. *Linn.; Gærtn. fr. t.* 45; *Lam. ill. t.* 396.

Tube of the calyx obovate, coherent with the ovary; limb divided into 4 oblong persistent segments. Petals as many as the segments of the calyx, oblong, emarginate, coriaceous, conduplicate, and when young embracing the alternate stamens, the margins each with a double row of long woolly hairs. Stamens twice as many as the petals, alternating with them: anthers nearly sessile, large, linear-oblong. Ovary 2-celled, with 2 ovules in each cell. Style conical, short, 2-furrowed. Stigma 2-toothed. Fruit ovate or oblong, crowned near the base with the persistent segments of the calyx, longer than the tube, at length perforated at the apex by the radicle of the germinating embryo.—Trees, with quite entire leaves and axillary inflorescence.

959. (1) R. *Candelaria* (DC.:) leaves oval, cuspidate: peduncles 3–6-flowered: germinating embryo subulate-clavate, acute.—*DC. prod.* 3. *p.* 32; *Wall.! L. n.* 4878; *Wight! cat. n.* 1041.—R. mangle, *Roxb. fl. Ind.* 2. *p.* 459. —*Rheed. Mal.* 6. *t.* 34; *Rumph Amb.* 3. *t.* 71, 72.

II. KANDELIA.—Rhizophora § Kandelia. *DC.*

Tube of the calyx campanulate, coherent with the ovary; limb divided into 5–6 linear persistent segments. Petals as many as the segments of the calyx, membranaceous, linear at the base, cleft to below the middle into numerous capillary segments, glabrous. Stamens numerous, 6–8 times as many as the petals; filaments subulate, as long as the calycine segments; anthers

Digitized by Google

small, linear oblong. Ovary 1-celled, ovules 6, pendulous from the top of a central columella. Style filiform. Stigma small, 3-toothed. Fruit oblong, longer than the tube of the calyx, crowned near the base by its segments, at length perforated by the germinating embryo.—Shrubs with quite entire leaves, and axillary inflorescence.

960. (1) K. *Rheedei* (W. & A.:) leaves linear-oblong, obtuse; 2–3-chotomous, 4–9-flowered: germinating embryo subulate-clavate, acute.—*Wight! cat. n.* 1042.—Rhizophora Candel, *Linn. sp. p.* 634; *DC. prod.* 3. *p.* 32; *Spr. syst.* 2. *p.* 235; *Wall.! L. n.* 4876.—*Rheed. Mal.* 6. *t.* 35.

III. BRUGUIERA. *Lam. ill. t.* 397 (not of *Pet. Thouars*).

Calyx-tube turbinate, cohering with the ovary: limb divided into 5–13 persistent segments. Petals as many as the calycine segments, oblong, bifid, coriaceous, conduplicate, each embracing two stamens, woolly along the margin. Stamens twice as many as petals, and inserted by pairs opposite to them: filaments unequal, half the length of the petals: anthers linear or sagittate. Ovary 2–4-celled; ovules 2 in each cell. Style nearly the length of the stamens. Stigma 2–4-toothed. Fruit contained within the tube of the calyx, crowned at the apex by its segments (rarely longer than the tube with the segments around its base?), at length perforated by the germinating embryo.—Trees or shrubs with quite entire leaves, and axillary inflorescence.

To this genus belongs *Rhizophora Timoriensis*, DC., *R. caryophylloides*, Jack, *R. parviflora*, Roxb., and perhaps *R. sexangula*, Lour. Roxburgh represents his *R. decandra* (in E. I. C. mus. tab. 1140) with the fruit as in *Rhizophora*, but the flower as in *Bruguiera*: in the Flora Indica he has omitted this species entirely: his drawing may have therefore been afterwards considered by him as erroneous.

961. (1) B. *gymnorhiza* (Lam.:) leaves ovate-oblong, acuminated at both ends: peduncles solitary, 1-flowered, drooping: calyx about 12-cleft: segments linear, acuminated, triquetrous towards the point: petals 2-lobed, with about 5 short bristles: ovary 3–4-celled: germinating embryo somewhat cylindric, tapering towards each end.—*Lam. ill. t.* 397; *Spr. syst.* 2. *p.* 602; *Wight! cat. n.* 1043.—Rhizophora gymnorhiza, *Linn. sp. p.* 634; *DC. prod.* 3. *p.* 33; *Roxb. fl. Ind.* 2. *p.* 460; *in E. I. C. mus. tab.* 1246; *Wall.! L. n.* 4874.

†962. (2) B. *cylindrica* (W. & A.) leaves oval, acuminated at both ends: peduncles 1–2-flowered: calyx 8-cleft; segments oblong-acute, flat: germinating embryo cylindric, obtuse.—Rhizophora cylindrica, *Linn. sp. p.* 634; *DC. prod.* 3. *p.* 32; *Spr. syst.* 2. *p.* 235.—*Rheed. Mal.* 6. *t.* 33.

We are not aware that this has been seen by any modern botanist. Roxburgh enumerates a species under the name of *Rh. cylindrica*, in his hort. Benghalensis, but we suspect the plant he intended is *Rh. parviflora* of the fl. Indica, a species apparently only distinguishable from *B. cylindrica* by the more numerously flowered peduncles.

IV. CARALLIA. *Roxb.; DC.*—Baraldeia, *Pet. Th.; DC.*

Calyx-tube somewhat globose, 5–7-lobed; lobes short, triangular. Petals as many as the lobes of the calyx, unguiculate. Stamens twice as many as the petals. Ovary globose, adnate to the calyx, crowned with a glandular ring between the calyx and the style, 1-celled with 1–3 ovules (Roxb.), or 5 celled with 2 ovules in each cell. Style about as long as the stamens. Stig-

Digitized by Google

ma large, peltate. Fruit indehiscent, baccate, 1-celled, reniform.—Evergreen glabrous trees. Leaves shining above, serrated or toothed, somewhat rigid. Peduncles axillary, thick, short, rigid, about twice bifid or trifid, several-flowered.

We have not seen any of the three described species, and have therefore taken our character from a combination of these given by others. Several points, however, require to be re-examined: 1. Whether the ovary of *C. lucida* be really 1-celled with several ovules, or whether it be 3-celled with solitary ovules, or lastly, if it be actually 3-celled with two ovules in each, being then more analogous to *C. lanceolata*? 2. What is the structure of the fruit of *C. lanceolata*? 3. What is the structure of the ovary, stigma, and fruit, of *C. Barraldeia* (*Bar. madagascariensis*, DC.)? 4. The number of seeds in the fruit, and whether or not there be albumen.—Probably this genus, with *Cassipourea*, ought to form a distinct suborder: neither appear to grow in salt-water marshes, nor to have the seed germinating within the fruit, as in the true *Rhisophoreæ*, between which and *Salicarieæ* they would thus form the link.

963. (1) C. *lucida* (Roxb.:) leaves oval, acuminated, finely serrated: petals 6–7, roundish, entire, waved on the margin, much larger than the segments of the calyx: stigma concave, 3-lobed.—*Roxb. Cor.* 3. *t.* 211; *fl. Ind.* 2. *p.* 481; *DC. prod.* 3. *p.* 33; *Spr. syst.* 2. *p.* 460; *Wall. L. n.* 4880.

ORDER LX.—COMBRETACEÆ. *R. Brown.*

Calyx 4–5-lobed, lobes deciduous. Petals alternate with the lobes, or wanting. Stamens twice as many as the lobes, rarely equal in number to them or thrice as many: filaments distinct, subulate: anthers bilocular, bursting longitudinally. Ovarium coherent with the tube of the calyx, 1-celled: ovules 2–5, pendulous from the apex of the cavity: style 1, slender: stigma simple. Fruit drupaceous, baccate, or nut-like, 1-celled, indehiscent, often winged. Seed solitary (by abortion), pendulous. Albumen none. Radicle superior: cotyledons usually leafy and either convolute or variously folded, sometimes fleshy and plano-convex.—Trees or shrubs. Leaves alternate or opposite, exstipulate.

TRIBE I.—TERMINALIEÆ. *DC.*

Calyx 4–5-cleft. Petals usually wanting. Stamens 8–10. Cotyledons spirally convolute.

I. TERMINALIA. *Linn.*

Flowers often polygamous from abortion. Limb of the calyx deciduous, campanulate, 5-cleft, the lobes acute. Petals wanting. Stamens 10, in a double row, longer than the calyx. Ovary 2–3-ovuled. Style filiform, somewhat acute. Drupe not crowned by the calyx, often dry, indehiscent, 1-seeded. Seed almond-like. Cotyledons spirally convolute.—Trees or shrubs. Leaves alternate or rarely opposite, sometimes crowded towards the extremities of the branches. Flowers spiked: spikes racemose or panicled, bisexual in the lower part of the spike, male in the upper.

§ 1. *Drupe compressed, winged or much attenuated at the margins.*—Catappa, *Gærtn. fr. t.* 127, 217.—Terminalia, *Lam. ill. t.* 848.

964. (1) T. *angustifolia* (Jacq.:) leaves linear-lanceolate, somewhat repand, attenuated at both ends, the under side and the petioles pubescent or hairy:

Digitized by Google

glands 2, at the apex of the petiole: drupes compressed, 2-winged, gibbous on one side.—*Jacq. hort. Vind.* 3. *t.* 100; *DC. prod.* 3. *p.* 11.—T. Benzoin, *Linn.*; *Spr. syst.* 2. *p.* 358.—Croton Benzoe, *Linn. mant.*—Catappa Benzoin, *Gærtn. fr.* 2. *t.* 127.

965. (2) T. *Catappa* (Linn.) leaves about the extremities of the branchlets, short petioled, obovate, cuneate and attenuated but at the same time slightly cordate at the base, a little repand, with a large depressed gland beneath on each side of the midrib near the base: racemes axillary, solitary, simple, shorter than the leaves: drupe oval, compressed, glabrous, with elevated navicular margins, convex on both sides.—*α*; leaves softly pubescent beneath. —T. Catappa, *Linn. Mant. p.* 519; *DC. prod.* 3. *p.* 11; *Spr. syst.* 2. *p.* 359; *Lam. ill. t.* 848. *f.* 1.—*Rheed. Mal.* 4. *t.* 3, 4.—*β*; adult leaves glabrous on both sides.—*Wight! cat. n.* 1044.—T. Catappa, *Roxb. fl. Ind.* 2. *p.* 430; *in E. I. C. mus. tab.* 1002; *Blume bijdr. ned. Ind. p.* 640; *Wall.! L. n.* 3975.—T. moluccana, *Lam. enc. meth.* 1. *p.* 349; *Willd. sp.* 4. *p.* 968; *DC. prod.* 3. *p.* 11; *Spr. syst.* 2. *p.* 359.—T. myrobalana, *Roth, nov. sp. p.* 378.—T. subcordata, *Willd. sp.* 4. *p.* 968; *Spr. syst.* 2. *p.* 359.—T. intermedia, *Spr. syst.* 2. *p.* 359.—Juglans Catappa, *Lour.*—*Rumph. Amb.* 1. *t.* 68.

We have not seen *T. Moluccana* of Wall. L. n. 3969.

§ 2. *Drupe ovate, even or obscurely angled.*—Myrobolanus, *Gærtn. fr.* 2. *t.* 97; *Lam. ill. t.* 849.—Badamia, *Gærtn. l. c.*

966. (3) T. *Belerica* (Roxb.:) leaves about the extremities of the branchlets, long-petioled, obovate, obtuse, or shortly acuminated, quite entire, glabrous above and usually also beneath: spikes axillary, solitary, almost the length of the leaves: bisexual flowers sessile; male shortly pedicellate, with a large hairy glandular disk in the bottom of the calyx: drupe obovate, obscurely 5-angled, fleshy, covered with a grayish silky down.—*Roxb. Cor.* 2. *t.* 198; *fl. Ind.* 2. *p.* 431; *in E. I. C. mus. tab.* 1720; *DC. prod.* 3. *p.* 12; *Spr. syst.* 2. *p.* 358; *Wall. L. n.* 3968; *Wight! cat. n.* 1045.—T. punctata, *Roth, nov. sp. p.* 381; *DC. prod.* 3. *p.* 13.—Myrobalanus Bellirica, *Breyn.*; *Gærtn. fr.* 2. *t.* 97.

Roxburgh describes the petiole with "two opposite glands at the upper side of the apex, and sometimes near the base," which we have not been able to observe on any of our specimens. The presence or absence of glands, however, and of pubescence, as Roth has already observed, is only of secondary importance. *T. Moluccana* of Roxburgh, and probably of Blume (but not of Lamarck), is allied to this: it has precisely the same kind of fruit and male flowers, but the petioles are short giving quite a different aspect to the plant.

967. (4) T. *Chebula* (Retz:) leaves nearly opposite, shortly petioled, ovate or oblong, acutish or obtuse, obtuse or cordate at the base, quite entire, when young clothed particularly above with glossy silky hairs, adult ones glabrous and sometimes glaucous, upper surface inconspicuously dotted, under closely reticulated with purplish veins: glands one on each side at the apex of the petiole, with occasionally some additional ones on the margin towards the base of the leaf: spikes terminal, often panicled: drupe oval (about 1½ inch long by an inch in diameter), glabrous; nut irregularly and obscurely 5-furrowed. *Retz, obs.* 5. *p.* 31; *DC. prod.* 2. *p.* 12; *Spr. syst.* 2. *p.* 359; *Roxb. Cor.* 2. *t.* 197; *fl. Ind.* 2. *p.* 433; *Wall.! L. n.* 3967; *Wight! cat. n.* 1046.—T. reticulata, *Roth, nov. sp. p.* 381; *DC. prod.* 3. *p.* 13.—T. Myrobalanus citrina, *Koen.*—Melanoxylon Cadika-marum, *Koen.*—Myrobalanus Chebula, *Gærtn.* ? *fr. t.* 97. *f–m.*

From this *T. citrina*, Roxb. (who quotes Gærtn. fr. 2. t. 97. *n–s*), is said to differ by the leaves between oblong and broad-lanceolate tapering at the base, the drupe oblong-lanceolate (2 inches long by ⅔ds of an inch in diameter),

Digitized by Google

and the nut oblong and deeply 5-grooved: this last character is however not supported by Gærtner's figure, while his *M. Chebula* above referred to appears to have the nut deeply 5-furrowed. We are inclined to place less dependence on the grooves of the nut than on the shape of the fruit itself, if indeed both are not, along with the following, varieties of the same plant.

† 968. (5) T. *Travencorensis* (W. & A.:) tender parts hairy; leaves narrow-lanceolate, acuminated, when young clothed with much ferruginous hair: drupe oval.—T. angustifolia, *Roxb. fl. Ind.* 2. *p.* 437; *Wall.*? *L. n.* 3971.—— Tinnevelley and Travancore; *Mr G. Young.*

"The fruit is so much like the *Chebula myrabolans*, as scarcely to be distinguished from it, and they possess the same sensible qualities."—ROXB.

§ 3. *Drupes coriaceous, ovate, produced regularly with 5–7 equal longitudinal wings.*—Pentaptera, *Roxb.*

† 969. (6) T. *Berryi* (W. & A.:) bark smooth: branches drooping: leaves nearly opposite, from lanceolate to linear-oblong, glabrous, with two sessile glands on the margins of the apex of the short petiole at its junction with the leaf: spikes terminal, somewhat panicled.—Pentaptera angustifolia, *Roxb. fl. Ind.* 2. *p.* 437.——Balla-ghaut mountains; *Dr A. Berry.*

We do not observe this in Wallich's List, although Dr Roxburgh states that it bears flowers and fruit in the Calcutta Botanic Garden. The glands from being on the petiole, not on the under side of the leaf, are perceptible when viewed on either surface: and by this character it is said to differ from *T. (Pent.) Arjuna*, Roxb., which it most resembles.

† 970. (7) T. *crenulata* (W. & A.:) bark rugose: leaves nearly opposite, oblong, acute, crenulated, glabrous, with 1 or 2 cyathiform glands on the midrib on the under side far above the base.—Pentaptera crenulata, *Roxb. fl. Ind.* 2. *p.* 438.——Coromandel; *Dr A. Berry.*

We suspect this not to be at all distinct from *T. glabra*. Dr Wallich does not refer to it in his List.

971. (8) T. *glabra* (W. & A.:) bark smooth: leaves nearly opposite, narrow oblong, from subcordate to slightly cuneate at the base, obtuse or acute at the apex, entire or crenulated, glabrous on both sides, often reddish beneath, with some nearly sessile umbilicated glands towards the base of the midrib. —*Wight! cat. n.* 1047.—T. crenulata, *Roth, nov. sp. p.* 380.—T. cuneata, *Roth*? *nov. sp. p.* 379.—Pentaptera glabra, *Roxb. fl. Ind.* 2. *p.* 440; *in E. I. C. mus. tab.* 124; *Wall. L. n.* 3979.—P. obovata, *DC. prod.* 3. *p.* 14.—P. crenulata, *DC. l. c. p.* 15.—P. cuneata, *DC.*? *l. c. p.* 14.

972. (9) T. *tomentosa* (W. & A.:) bark deeply cracked: leaves nearly opposite, linear-oblong, obtuse, somewhat cordate at the base, crenulate, pubescent but finally glabrous above, tomentose or pubescent beneath, with some thick stalked turbinate glands on the midrib near the base: fruit glabrous.—*Wight! cat. n.* 1048.—T. elliptica, *Willd.*? *sp.* 4. *p.* 969; *DC.*? *prod.* 3. *p.* 13; *Spr.*? *syst.* 2. *p.* 358.—T. alata, *Roth, nov. sp. p.* 379.—P. tomentosa, *Roxb. fl. Ind.* 3. *p.* 440; *in E. I. C. mus. tab.* 125; *DC. prod.* 3. *p.* 14; *Wall.! L. n.* 3978.

Dr Wallich suspects this to be a variety of the last, and indeed there is no difference of any consequence between them, and the following also. We are not inclined to trust much to the glands being stalked or sessile. Our specimens from Dr Wallich (Wall. L. n. 3978, *g*) have the leaves very shaggy beneath, yet De Candolle, Roth, and even Roxburgh, attribute to it only pubescent leaves. We have therefore, along with Dr Wallich, in the absence of fruit, referred n. 1048 of Wight's Catalogue, the same as Wall. L. n. 3978. *c* (the leaves being shortly velvetty beneath), to this species instead of to *T. coriacea*; we doubt much also that the fruit being canescent or gla-

Digitized by Google

brous ought to afford sufficient grounds of distinction. What renders the whole more ambiguous is the numerous typographical errors observable in the descriptions of these species in the Flora Indica.

973. (10) T. *coriacea* (W. & A.:) bark deeply cracked: leaves nearly opposite, short-petioled, coriaceous, oval, cordate at the base, hard above, hoary and soft beneath, with 1 or 2 sessile turbinate glands at or near the base of the midrib: spikes panicled: nut hoary.—Pentaptera coriacea, *Roxb. fl. Ind.* 2. *p.* 438.

§ 4. *Drupes coriaceous, produced into* 3–5 *unequal wings.*—Chuncoa, *Pav.*—Gimbernatia, *Ruiz & Pav.*

974. (11) T. *paniculata* (W. & A.:) branches diverging: leaves nearly opposite, linear-oblong, with a cordate base, acute or obtuse at the apex, quite entire, coriaceous, rugose above, with sessile umbilicate glands beneath near the base: spikes forming a compound panicle: drupe with 1 large and 2 small wings.—*α*; leaves glabrous.—*Wight! cat. n.* 1049.—Pentaptera paniculata, *Roxb. fl. Ind.* 2. *p.* 442; *DC. prod.* 3. *p.* 14; *Wall.! L. n.* 3980.—*β*; leaves pubescent, hairy, or tomentose.—T. monaptera, *Roth, nov. sp. p.* 382; *DC. prod.* 3. *p.* 13.—T. paniculata, *Roth? l. c. p.* 383; *DC.? l. c.*

II. GETONIA. *Roxb.; Gærtn. fr.* 3. *t.* 217.—Calycopteris, *Lam. ill. t.* 357.

Limb of the calyx persistent, campanulate, 5-partite almost to the base, the lobes lanceolate and 3-nerved. Petals none. Stamens 10, protruded, shorter than the calycine segments, arranged in a double row, some inserted on the sinus of the lobes, others into the bottom of the calyx: anthers globose, didymous. Style filiform, pubescent, obtuse. Fruit a small dry crustaceous drupe (resembling a nut or seed), ovate-oblong, roundish pentagonal, crowned by the calyx, 1-celled, 1-seeded.—Climbing shrubs. Leaves opposite, shortly petioled, resinous-dotted beneath, young ones villous or tomentose particularly on the under side.

975. (1) G. *floribunda* (Roxb.:) panicles erect: stamens as long as the segments of the calyx.—*Roxb. Cor.* 1. *t.* 87; *fl. Ind.* 2. *p.* 428; *Spr. syst.* 2. *p.* 360; *Roth, nov. sp. p.* 216; *Wall.! L. n.* 4013; *Wight! cat. n.* 1050.—G. nitida, *Roth, l. c. p.* 217.—Calycopteris floribunda, *Lam.? ill. t.* 357; *Poir.? enc. meth. suppl.* 2. *p.* 41.

De Candolle, relying principally on the leaves being more glabrous, has referred *G. nitida*, Roth, to *G. nutans* of Roxburgh, a species which has not been found on the Peninsula. We have specimens before us from Heyne's herbarium exactly agreeing with Roth's character, but they are mixed by Heyne, and properly so, with the more tomentose states of the plant. In *G. nutans*, Roxb., the panicles are drooping and the stamina about one-fourth of the length of the tube of the calyx: but Dr Wallich has expressed doubts if even this be distinct from *G. floribunda*.

III. CONOCARPUS. *Gærtn. fr.* 2. *t.* 177.

Flowers aggregated on a common globular receptacle. Tube of the calyx as short as or longer than the ovary, persistent: limb 5-cleft, deciduous. Petals none. Stamens 5–10, exserted: anthers cordate: ovary compressed, 2-ovuled. Style 1, simple. Fruits coriaceous, scale-like, closely imbricated, indehiscent. Cotyledons spirally convolute.—Trees or shrubs. Leaves alternate or rarely nearly opposite, quite entire. Heads of flowers peduncled.

Digitized by Google

§ 1. *Tube of the calyx slender, much produced beyond the ovary, and resembling a pedicel to the limb: stamens* 10*: fruit imbricated upwards, produced at the apex into a long beak* (*the persistent calyx-tube*).—Anogeissus, *DC.*

976. (1) C. *latifolia* (Roxb.:) leaves without glands, elliptical or obovate, obtuse or emarginate, glabrous: peduncles branched, bearing several heads of flowers, or very short with the heads densely aggregated.—α; peduncles conspicuous.—*Wight! cat. n.* 1051.—C. latifolia, *Roxb. fl. Ind.* 2. *p.* 442; *DC. prod.* 3. *p.* 17.—Andersonia altissima, *Roxb. in E. I. C. mus. tab.* 19.—Anogeissus latifolius, *Wall.! L. n.* 4015.—β; partial peduncles very short; heads of flowers aggregated.—*Wight! cat. n.* 1097.

977. (2) C. *acuminatus* (Roxb.:) leaves without glands, oval or oblong-lanceolate, acute; when young pubescent, adult ones glabrous: peduncles simple, with one head of flowers.—*Roxb. fl. Ind.* 2. *p.* 443; *DC. prod.* 3. *p.* 17; *Wight! cat. n.* 1052.—Andersonia acuminata, *Roxb. in E. I. C. mus. tab.* 20.—A. lanceolata, *Rottl.; Heyne.*—Anogeissus acuminatus, *Wall.! L. n.* 4014.

IV. LUMNITZERA. *Willd.* (not *Jacq.*)—Pyrrhanthus. *Jack.*—Petaloma. *Roxb.* (not *Swartz*).—Bruguiera. *Pet.-Thouars* (not *Lam.*)

Limb of the calyx persistent, produced beyond the ovary, tubular-campanulate, 5-cleft; segments rounded, often unequal. Petals 5, acute, inserted on the calyx, twice as long as its limb, spreading or at length recurved. Stamens 5–10, erect; filaments subulate. Ovary oblong, compressed, 1-celled, with 3–5 pendulous ovules. Style subulate. Stigma acute. Drupe clove-shaped, ovate-oblong, more or less compressed, bluntly angled, crowned with the thick persistent calyx: nut linear-oblong, angled, 1-seeded. Cotyledons convolute.—Trees or shrubs. Leaves alternate, cuneate-obovate, retuse or emarginate, attenuated at the base into a very short petiole, obtusely crenated or often quite entire, glabrous, thick and somewhat fleshy, almost veinless. Spikes short, generally simple, axillary and solitary, or terminal and corymbose. Flowers white or red, with two very short bracteoles about the middle of the ovary, and one at the base.

The proportion of parts of the flower, if we can trust to Rheede, is occasionally quaternary: but this must be comparatively of rare occurrence, as neither Roxburgh or Jack appear ever to have seen it so.

978. (1) L. *racemosa* (Willd.:) spikes axillary: 5 stamens longer than the other alternating ones, about the length of the (white) petals.—*Willd. nov. ac. act. nat. cur. Berol.* 4. *p.* 186; *DC. prod.* 3. *p.* 22.—Jussieua racemosa, *Rottl.*—Petaloma alternifolia, *Roxb. fl. Ind.* 2. *p.* 372.—Combretum alternifolium, *herb. Madr.*—Pyrrhanthus albus, *Wall.! L. n.* 4019.—Bruguiera Madagascariensis, *DC. prod.* 3. *p.* 23.—Quisqualis sp. *Spr. gen. pl. p.* 357.—*Rheed. Mal.* 6. *t.* 37.——In salt marshes in the southern provinces, and Malabar (abundant at Warapoli), growing among the species of *Rhizophora.*

Although Rheede only describes 5 stamens, yet Roxburgh, Petit-Thouars, and Willdenow, concur in attributing to this species 5 as long as the petals, alternating with other 5 that are rather shorter: it is possible, however, that some or all of the latter may sometimes be abortive. In the allied *L. coccinea*, W. & A. (*Pyrrhanthus littoreus*, Jack. in Mal. misc. 2. p. 57, and Wall. L. n. 4018), the stamens are twice as long as the crimson petals, and vary from 5 to 10, 7 being the most frequent number: in that species the spikes are terminal and somewhat corymbose. Perhaps, as Dr Wallich suggests, the two ought to be conjoined.

Digitized by Google

V. POIVREA. *Comm.*

Limb of the calyx infundibuliform, 5-lobed, deciduous. Petals 5. Stamens 10, protruded. Ovary 2–3-ovuled. Style filiform, protruded, acute. Fruit oval or oblong, or 5-winged. Seed solitary, pendulous, 5-angled. Cotyledons irregularly convolute.—Usually climbing shrubs. Leaves opposite or alternate, quite entire. Spikes axillary and terminal. Bracteoles solitary under the flowers.

979. (1) P. *Roxburghii* (DC.:) unarmed, scandent: young parts villous: leaves opposite, oval-oblong, acuminated, when old glabrous: spikes terminal and axillary, panicled: bracteoles lanceolate: calyx turbinately campanulate: petals ovate, mucronate: stamens short: fruit membranously 5-winged.—*DC. prod.* 3. *p.* 18; *Wight! cat. n.* 1053.—Combretum Roxburghii, *Spr. syst.* 2. *p.* 331.—C. decandrum, *Roxb.* (not *Jacq.*) *Cor.* 1. *t.* 59; *fl. Ind.* 2. *p.* 232; *Wall.! L. n.* 4009.

To this genus also belongs *P. pilosa*, W. &. A., or *Comb. pilosum*, Roxb., Wall.! L. n. 4005; *Comb. squamosum*, Roxb., is said, by Mr G. Don in Linn. soc. trans. 15. p. 438, to have 5 petals and calycine segments: we only observe 4, nor does Roxburgh mention more.

TRIBE II.—COMBRETEÆ. *DC.*

Calyx 4–5-cleft. Petals 4–5. Stamens 8–10. Cotyledons usually thick, plano-convex or irregularly and longitudinally plaited; or thin, foliaceous and intricately folded.

VI. COMBRETUM. *Loefl.; Gærtn. fr.* 1. *t.* 36.

Calyx funnel-shaped; tube as short as or longer than the ovary: limb campanulate, 4-lobed, deciduous. Petals 4, inserted between the lobes of the calyx. Stamens 8, in two rows, four being opposite to the petals and inserted rather higher up and longer than the others. Ovary 2–5-ovuled. Style exserted, acute. Fruit 4-winged, 1-celled, 1-seeded, indehiscent. Seed pendulous. Cotyledons variously folded or plaited, often emarginate or 2-lobed.—Shrubs or trees more or less scandent. Leaves often opposite, quite entire. Spikes terminal and axillary, sometimes panicled.

980. (1) C. *ovalifolium* (Roxb.:) climbing, glabrous: leaves opposite, ovate or elliptical, obtuse or slightly acute, roundish at the base, paler beneath, minutely dotted above: spikes axillary and terminal, the latter arranged in panicles, peduncled, short, oblong or almost globose: rachis and calyx pubescent: bracteoles minute, scale-like: tube of the calyx not longer than ovary with which it coheres: limb cleft to the middle, with a hairy ring below the insertion of the stamens; segments triangular-ovate, reflexed; petals elliptic-oblong, retuse, about the length of the calyx-segments; wings of the fruit glabrous, semicircular.—*Roxb. fl. Ind.* 2. *p.* 226; *Wight! cat. n.* 1054.—C. laxum, *herb. Madr.!* (not *Jacq.* nor *Roxb.*)—C. Heyneanum, *Wall.! L. n.* 4001; *Wight! in Hook. bot. misc.* 3. *p.* 86. *suppl. tab.* 22.—C. albidum, *G. Don in Linn. soc. trans.* 15. *p.* 429 (excl. syn. *Roxb.*)—C. Roxburghii, *G. Don, l. c.*——Coromandel.

981. (2) C. *Wightianum* (Wall.:) climbing, glabrous: leaves opposite, elliptic-obovate, usually with a short sudden acumination, coriaceous, shining above: spikes axillary, on longish peduncles, elongated (longer than the leaves), lax: rachis and calyx pubescent: bracteoles obsolete or resembling minute tubercles: tube of the calyx 2–3 times longer than the ovary; limb cleft to the middle, with a hairy ring below the insertion of the stamens; segments triangular-ovate, acute, recurved: petals elliptic-oblong, emargi-

Digitized by Google

nate, about half as long as the lobes of the calyx.—*Wall.! L. n.* 4007; *Wight! cat. n.* 1055.—C. laxum, *Roxb. fl. Ind.* 2. *p.* 231 (not *Jacq.*)—*Rheed. Mal.* 7. *t.* 23.

VII. QUISQUALIS. *Rumph.; Linn.; Lam. ill. t.* 357.

Tube of the calyx slender, produced much beyond the ovarium, deciduous, the limb 5-cleft. Petals 5, oval-oblong, obtuse, longer than the calycine teeth. Stamens 10, protruded, inserted into the throat of the calyx, alternately shorter. Ovary oval-oblong, 4-ovuled. Style filiform, obtuse, exserted, cohering with the tube of the calyx. Drupe dry, 5-furrowed, acutely 5-angled. Seed solitary, pendulous, 5-angled. Cotyledons thick, fleshy, plano-convex.—Shrubs with somewhat scandent branches. Leaves opposite or occasionally alternate, quite entire, ovate. Spikes axillary and terminal.

982. (1) Q. *Indica* (Linn.:) young branches densely pubescent: leaves ovate, rounded or slightly cordate at the base, when young more or less villous or pubescent, afterwards almost glabrous: bracteas ovate-rhomboid, acuminated, slightly hairy, particularly on the margin: flowers lax; petals oval-oblong, clothed externally with close-pressed pubescence.—*DC. prod.* 3. *p.* 23; *Roxb. fl. Ind.* 2. *p.* 426; *Wall.! L. n.* 4010; *Wight! cat. n.* 1056. —Q. pubescens, *Burm. Ind. p.* 104. *t.* 35. *f.* 2; *Spr. syst.* 2. *p.* 331.—Q. glabra, *Burm. l. c. t.* 28. *f.* 2; *DC. l. c.; Spr. l. c. p.* 332.—Q. Loureiri, *G. Don in Mill. dict.* 2. *p.* 667.—Q. villosa, *Roxb. fl. Ind.* 2. *p.* 426; *DC. l. c.; Spr. l. c. p.* 331.—*Rumph. Amb.* 5. *t.* 38.

The pubescence on the leaves and bracteas varies much according to the locality from which the specimen was obtained, and the age of the plant: the shape of the leaves, as is obvious from the numerous specimens before us both from China and the Peninsula, varies from cordate-ovate and almost obtuse, to oblong and acuminated. We have referred to Roxburgh's *Q. villosa*, on the faith of a specimen from Pegu in the Banksian herbarium. *Q. densiflora*, Wall.! L. n. 4011, appears a very distinct species, and perhaps the only other one of the genus.

ORDER LXI.—MEMECYLEÆ. *DC.*

Calyx 4–5-lobed or toothed: the limb striated in the bottom on the inside. Petals 4–5, alternate with the sepals, imbricated into the form of a cone during æstivation. Stamens twice as many as the petals: filaments distinct, in æstivation almost wanting: anthers curved, 2-celled, opening by 2 short clefts, during æstivation pointing downwards towards the bottom of the limb of the calyx, afterwards by the elongation of the filaments erect: connectivum produced below the cells into a kind of beak. Ovarium 1-celled, coherent with the tube of the calyx: ovules 4–10, erect, seated at the base of the cell: style 1, filiform: stigma simple. Fruit baccate, crowned by the limb of the calyx, usually from abortion 1-celled. Seeds nut-like, often solitary from abortion, erect: testa crustaceous. Albumen none. Radicle curved downwards: cotyledons foliaceous, crumpled and wrapped up, the one round the other, into the form of a little ball.—Shrubs. Leaves opposite, simple, entire, without stipules or dots, feather-nerved or rarely 3-nerved.

Digitized by Google

I. MEMECYLON. *Linn.; Lam. ill. t.* 284; *Gærtn. fr.* 2. *t.* 127, 179.—Valikaha. *Adans.*—Scutia. *Lour.*

Limb of the calyx small, obtusely 4-toothed or repand, or almost entire. Petals 4, oval. Stamens 8, usually longer than the petals: anther-cells opening by a short cleft at the end next the beak.—Shrubs. Branches knotty at the origin of the leaves; young branches usually 4-angled. Leaves when young seldom truly 3-nerved, usually feather-nerved, the divaricating nerves being often confluent near the margin, and forming apparently two lateral ones; adult ones coriaceous, exhibiting only a midrib, the other nerves being concealed within the substance of the leaf.

In one or two species the parts of the flowers occasionally follow the quinary arrangement; and then we scarcely know of any character to distinguish *Mouriria* of Jussieu. In all the species of *Memecylon* which we have examined, the anthers open near the junction of the beak or produced part of the connectivum: in *Mouriria Guianensis*, the only species we have seen, the dehiscence takes place at the extremity; or in other words, the clefts in *Memecylon* are at the base, in *Mouriria* at the apex, of the anther. It remains, however, yet to be ascertained, if this difference of structure be common to all the species of each genus respectively. Both genera have been described with several cells to the fruit; and De Candolle has obviously mistaken in *Memecylon* the testa of the seed for the nucleus of the fruit: Gærtner's description is correct. The structure of the seed of *Mouriria* is yet unknown: the ovary and ovules are certainly as in *Memecylon;* in both, after the expansion of the flower-bud, several ovules immediately become abortive and often disappear: of others the remains may be traced even when the fruit is almost ripe.

983. (1) M. *ramiflorum* (Lam.:) branches terete: leaves shortly petioled, ovate or oblong, retuse or obtuse or slightly acute, 1-nerved; peduncles axillary and below the leaves on the older branches, incrassed at the apex, and forming a kind of small receptacle, sometimes wanting with the receptacle sessile: pedicels 1-flowered, fascicled on the receptacle, each springing from a small sessile cup-shaped scale or bractea: stamens elongated: style about twice the length of the filaments: fruit 1-seeded.—*Lam. enc. meth.* 4. *p.* 8; *DC. prod.* 3. *p.* 6; *Wight! cat. n.* 1057.—M. umbellatum, *Gærtn. fr.* 2. *t.* 127. *f.* 4; *Blume?; Wall.? L. n.* 4109.—Melaleuca bicolor, *Poir. enc. meth. suppl.* 3. *p.* 624.—*Burm. Zeyl. t.* 31.

Burmann, in his figure of this and of *M. capitellatum*, has only noticed 4 stamens, thereby leading Linnæus and others to refer t. 31. to the very different *Samara læta.*

984. (2) M. *tinctorium* (Koen.:) arborescent, branches terete: leaves shortly petioled ovate or oblong, 1-nerved: peduncles axillary and below the leaves on the older branches, bearing a more or less compound corymb of pedicellate flowers: stamens shortish: style about the length of the stamens: fruit globose, crowned with the 4-toothed limb of the calyx: fruit 1-2-seeded. —*α*; leaves obtuse or retuse.—*Wight! cat. n.* 1058.—M. tinctorium, *Willd. sp.* 2. *p.* 347; *Spr. syst.* 2. *p.* 235.—M. edule, *Roxb. Cor.* 1. *t.* 82; *fl. Ind.* 2. *p.* 260; *DC. prod.* 3. *p.* 6; *Wall.! L. n.* 4107.—*β*; leaves more or less acuminated.—*Wight! cat. n.* 1059.—*Rheed. Mal.* 5. *t.* 19.

We possess the second variety also from Ceylon: it may perhaps be Smith's *M. ovatum*, or De Candolle's *M. laxiflorum*, but the inflorescence of both of these species is too vaguely described to permit us to refer to them with any kind of certainty. Roxburgh's figure (Cor. 1. t. 82) is somewhat between the two varieties, having leaves more ovate than is usual in *α*, and not so taper-pointed as in *β*. The peduncles vary from about a line to upwards of an inch in length.

985. (3) M. *Heyneanum* (Benth:) branches terete: leaves petioled, lanceolate, much acuminated: peduncles aggregated, axillary or on the older

Digitized by Google

branches below the leaves, about the length of the petiole, each bearing an umbel of pedicellate flowers, the pedicels about as long as the peduncle: stamens and style about equal in length, short.—*Wall.! L. n.* 4102; *Wight! cat. n.* 1060.

† 986. (4) M. *grande* (Retz:) arborescent, branches terete: leaves ovate, much acuminated (half a foot long): peduncles axillary, alternate, 4–5-cleft, branches many-flowered.—*Retz, obs.* 4. *p.* 26; *DC.? prod.* 3. *p.* 6; *Spr. syst.* 2. *p.* 235; *Wall.? L. n.* 4103.

De Candolle describes the leaves with a short petiole, but of this Retz makes no mention; we suspect that it may prove to be a broad-leaved state of the last species. Smith refers here Rheed. Mal. 2. t. 15, seeming to indicate that the plant which he had in view was the following, of which it is a pretty good figure.

987. (5) M. *amplexicaule* (Roxb.:) somewhat arborescent, branches terete: leaves sessile, cordate at the base, from ovate to oblong and gradually acuminated: peduncles wanting; pedicels 1-flowered, arranged on a sessile axillary (or lateral on the older branches) tubercle or receptacle: petals orbicular, sessile: stamens scarcely longer than the petals, about half as long as the style: fruit somewhat globose, 1–3-celled, 1–3-seeded.—*Roxb. fl. Ind.* 2. *p.* 261; *in E. I. C. mus. tab.* 1055; *Wight! cat. n.* 1061.—M. cordatum, *Wall. L. n.* 4100 (scarcely of *Lamarck*).—M. depressum, *Benth.! in Wall. L. n.* 4101.—*Rheed. Mal.* 2. *t.* 15.——Travancore. Malabar.

The leaves vary much on the same specimen, being sometimes broadly cordate-ovate, sometimes narrow cordate-lanceolate: in length they vary from an inch and a half to more than half a foot. Lamarck's *M. cordatum*, var. β, may perhaps be this species, but he mentions its having peduncles, and that the pedicels are arranged in verticils round them, forming corymbs.

† 988. (6) M. *pyriforme* (Wight).—*Wight in Wall. L. n.* 4106.

Dr Wight not having retained a similarly named specimen of this plant, and Mr Arnott having received none of it from Dr Wallich, we are unable to determine what it is: we, however, have reason to suspect it to consist of specimens with very immature fruit of *M. ramiflorum*, in which the ovary when a little advanced assumes a pyriform shape.

† 989. (7) M. *sessile* (Benth.)—*Wall. L. n.* 4112.——Neelgherries.

Probably a mere state of *M. ramiflorum*, with the tubercle or receptacle sessile, without the intervention of a peduncle.

ORDER LXII.—MELASTOMACEÆ. *Juss.*

Calyx with 3–5 teeth or divisions, which are more or less deep, or are sometimes united and separate from the tube like a lid. Petals equal to the segments of the calyx, perigynous, twisted in æstivation. Stamens either equal in number to the petals and alternate with them, or usually twice as many, the alternate ones of a different shape and perhaps never with fertile pollen: filaments in æstivation bent downwards towards the bottom of the calyx: anthers long, 2-celled, bursting usually by one or two terminal pores, rarely longitudinally. Ovarium with several cells, rarely completely combined with the tube of the calyx, very rarely entirely free from it, usually cohering with it more or less by means of 3–10 longitudinal nerves, thus forming as many cases as the anthers which they contain during æstivation: ovules indefinite: style 1: stigma simple, entire, capitate or reduced

Digitized by Google

to a mere point. Placentæ in the axis. Fruit plurilocular; either free and then capsular, valvate and loculicide; or adherent, baccate (a balausta), and indehiscent. Seeds numerous, minute. Albumen none. Embryo straight or curved: radicle pointing to the hilum: cotyledons equal or unequal.—Leaves opposite, undivided, not dotted, 3–9-nerved.

I. SONERILA. *Roxb.*

Calyx tube oblong or somewhat 3-angled, cohering with the ovary with 3–6 longitudinal lines: limb trifid, the segments deciduous. Petals 3, ovate-lanceolate, acute. Stamens 3: anthers oblong, pointed, straightish, bifid at the base, opening at the apex by two pores; connectivum not produced at the base. Ovary truncated and glabrous at the apex. Style filiform. Stigma obtuse. Capsule turbinate, crowned with the margin of the calyx which is thickened on the inside, 3-celled, 3-valved, the valves opening at the apex only. Seeds cuneate-obovate, sharp and somewhat grooved along one side: hilum at the base.—Herbaceous or suffrutescent usually small plants. Leaves membranous, hairy, opposite, one of them often a little smaller than the other, rarely quite abortive. Peduncles axillary or terminal, few-flowered. Flowers racemose or fascicled, rose-coloured.

990. (1) S. *Rheedei* (Wall.:) stem short, hairy: leaves ovate, somewhat cordate at the base, remotely bristle-serrate, feather-nerved; upper surface sprinkled with short thick bristles arising from whitish spots; under paler, somewhat scaly: peduncles solitary, axillary or terminal, hairy, about the length of the leaves, with 4–8 fascicled or somewhat umbellate pedicellate flowers at the apex: calyx hairy: petals ovate, pointed: anthers oblong, subulate, sagittate at the base: style longer than the stamens: stigma peltate.—*Wall.! L. n.* 4096.—*Rheed. Mal.* 9. *t.* 65.

In Dr Wallich's specimens, which are rather imperfect, there is no stem, only 2–3 leaves, and one peduncle or scape: in Rheede's figure there is a short stem as in *S. maculata*, to which it is perhaps too closely allied.

991. (2) *S. maculata* (Roxb.:) stem short, terete, hairy; branches diffuse, hairy: leaves ovate, or unequally cordate, obtuse or shortly acuminated, sprinkled on both sides with long tapering bristles arising from white spots, feather-nerved: peduncles axillary, bearing a curved raceme of several unilateral flowers: petals ovate, pointed: anthers sagittate at the base, acuminated: style the length of the stamens: stigma simple, obtuse: capsules somewhat clavate, 3-sided, glabrous.—*Roxb. fl. Ind.* 1. *p.* 177; (*ed. Wall.*) 1. *p.* 180; *Wall.! L. n.* 4091.—S. Rottleri, *Wall. ! L. n.* 4097.——Courtallum.

The spots described by Roxburgh, and figured in our first species by Rheede, are not distinguishable in the dried specimen. We can find no mark by which to separate *S. Rottleri* from *S. maculata*, except that the capsules of the latter appear shorter; but as in the specimens before us (Dr Wallich's), they are immature, we dare not found a distinction on that point.

992. (3) S. *Brunonis* (W. & A.:) herbaceous?: stems (about a foot high or more) erect, branched; branches acutely 4-angled, glabrous: leaves long-petioled, ovate, bristle-serrated, 5–7-nerved at the base, hairy or at length glabrous: peduncles terminal, longer than the leaves: flowers unilateral, longish-pedicelled, racemose: calyx glabrous: petals lanceolate, pointed: anthers ovate, short-pointed: style about the length of the stamens: stigma capitate: capsules turbinate, 3-sided, strongly and prominently 6-ribbed,

Digitized by Google

three of the ribs forming the angles, the other three on sides.—*Wight! cat. n.* 1142.——Courtallum.

We have another species (*S. Zeylanica*, W. & A.) very closely allied, perhaps a variety, from Ceylon, in which the stems are shorter but also 4-angled and glabrous; the leaves 3–5-nerved, considerably smaller, and on much shorter petioles; racemes axillary as well as terminal, and almost or quite sessile; and petals ovate, pointed: thus seeming to connect the present species with *S. grandiflora*.

993. (4) *S. grandiflora* (Brown:) erect?, glabrous: leaves elliptic, attenuated at both ends, bristle-serrated, 3-nerved at the base: peduncle terminal (always?), about the length of the leaves, flattened at the apex and there bearing a slightly curved raceme of several unilateral large flowers: petals ovate, pointed: style as long as the stamens: stigma simple: capsule glabrous, 3-sided, scarcely the length of the pedicel.—*Wall.! L. n.* 4099.——Neelgherries; *Noton.*

II. OSBECKIA. *Linn.; Lam. ill. t.* 283.

Calyx-tube ovate, usually covered with stellate bristles or pubescence; limb 4–5-cleft, with appendages between the lobes springing from the outside. Petals 4–5. Stamens 8–10: filaments glabrous: anthers nearly equal and similar to each other, shortly rostrate or very rarely truncated, opening by a single terminal pore; the connectivum with 2 short auricles at the base. Ovary covered with bristles at the apex. Capsule 4–5-celled. Seeds cochleate: hilum orbicular, at the base.—Herbaceous or usually shrubby plants. Flowers terminal.

994. (1) *O. Zeylanica* (Linn.:) herbaceous, annual: stem and branches tetragonal, the angles clothed with adpressed bristles: leaves spreading or reflexed, oval-lanceolate, strigose, quite entire, bristle-ciliated, 3-nerved: flowers very shortly peduncled, axillary and solitary, or 1–7 together and terminal: calyx tubular, covered with spreading long bristles that are palmately divided from the very base; segments of the limb 4, deciduous; appendages deciduous, pretty long, crowned with stellate bristles: anthers 8, with a fine subulate beak: ovary crowned with 16–20 bristles.—*DC. prod.* 3. *p.* 141; *Spr. syst.* 2. *p.* 312; *Roxb. fl. Ind.* 2. *p.* 223; *in E. I. C. mus. tab.* 1233; *Wall.! L. n.* 4069; *Wight! cat. n.* 1143.—*Pluk. t.* 173. *f.* 4.——Courtallum, Vendalore, &c.

995. (2) O. *truncata* (Don! mst.:) herbaceous, annual: stems slightly branched, 4-angled; the angles clothed with adpressed and afterwards spreading or deflexed hairs: leaves spreading or deflexed, ovate, strigose, quite entire, ciliated, 3-nerved, the four upper ones approximated and forming a kind of involucre under the flowers: flowers (very small) terminal, nearly sessile, aggregated: calyx urceolate, covered with spreading simple or palmate long bristles; segments 4, deciduous: appendages deciduous, shortish, crowned with bristles: anthers 8, truncated (without any beak!): ovary crowned with 16–20 bristles.—*Wight! cat. n.* 1144.—O. coronata, *Don! mst.*

†996. (3) O. *Leschenaultiana* (DC.:) shrubby: branches 4-angled, beset with stiff hairs: leaves sessile, ovate, somewhat acute, approximate, 5-nerved, villous on both sides: flowers scssile, bracteated, about 3 together, capitate: calyx-tube globose, covered with palmately ciliated short scales; segments 4, lanceolate.—*DC. prod.* 3. *p.* 142.——Neelgherries.

So far as the character goes, this agrees perfectly with our next species in all points except the number of calyx-segments, and consequently of stamens. Perhaps the specimens were imperfect, and De Candolle may have overlooked the other lobe.

Digitized by Google

997. (4) O. *Wightiana* (Benth.:) shrubby: branches herbaceous, scabrous with short bristles: leaves nearly sessile, ovate, slightly acute, quite entire, 5–7-nerved; upper side covered with adpressed somewhat shining hairs; under hirsute on the nerves and shortly tomentose between them: flowers (large) terminal, at first densely capitate and bracteated, afterwards often solitary: calyx campanulate, densely covered with short adpressed scales, bearing a tuft of long bristles at the apex; segments 5, deciduous; appendages deciduous, covered with bristles: anthers 10, linear-oblong, scarcely beaked: style clavate.—*Benth.! in Wall.! L. n.* 4060; *Wight! cat. n.* 1145, 1146.—O. capitata, *Don! mst.*—Ben Kadali, *Rheed. Mal.* 4. *p.* 89.——Neelgherries.

A very beautiful species, with flowers as large as in *Melastoma malabarica*.

998. (5) O. *virgata* (Don! mst.:) shrubby: branches straight, twiggy, 4-angled, hispid: leaves petioled, lanceolate or ovate-lanceolate, 3-nerved, quite entire; upper side sprinkled with adpressed hairs; under hirsute on the nerves, otherwise glabrous: flowers aggregated: calyx-tube urceolate, sprinkled with simple and 2–3-partite spreading bristles, sometimes nearly naked; segments 5, deciduous; appendages deciduous, being usually deeply trifid or sometimes simple bristles: anthers 10, shortly beaked; ovary crowned with numerous bristles: style incurved near the apex.—*Wight! cat. n.* 1147.—O. inappendiculata, *Don! mst.*—Melastoma glomerata, *Herb. Klein!*—*Rheed. Mal.* 4. *t.* 44?.——Mountains between Tinnevelly and Travancore; *Klein.*

999. (6) O. *cupularis* (Don! mst.:) shrubby: branches nearly terete or slightly 4-angled, covered with adpressed bristles: leaves short-petioled, 3–5-nerved, quite entire, oval or oblong; upper side sprinkled with bristles; under hirsute on the nerves, sprinkled with bristles between them: flowers corymbosely racemose: calyx-tube shortly urceolate, copiously sprinkled with simple and stellate longish spreading bristles; segments 5, deciduous; appendages deciduous, longish, bearing a stellate tuft of bristles at the apex: anthers 10, linear-oblong, somewhat obtuse: ovary crowned with numerous bristles: style incurved near the apex.—*Wight! cat. n.* 1148.—O. Wightiana, *Benth.? in Wall. L. n.* 4074 (not 4060).——Malabar Coast. Southern provinces.

Although this differs considerably in habit from the last, it does so very little in the character. Perhaps Rheede's Mal. 4. t. 43, ought to be referred here, instead of to the next, under which it is usually quoted.

1000. (7) O. *aspera* (Blume:) shrubby: branches obscurely 4-angled, rough from short strigose bristles: leaves shortly petioled, oblong-ovate or oblong-lanceolate, acute, obtuse at the base, 3-nerved; upper side copiously clothed with adpressed bristles; under hirsute on the nerves, and harshly pubescent between them: flowers on short pedicels, terminal, somewhat racemose: calyx-tube cup-shaped, copiously clothed with adpressed rigid pubescence; segments 5, ovate-oblong, obtuse, deciduous; appendages caducous, consisting of a tuft of a few (sometimes only 1) bristles: stamens 10; anthers acuminated but scarcely beaked: style incurved at the apex; ovary crowned with numerous bristles.—*Don! mst.; Wight! cat. n.* 1149.—O. glauca, *Benth.? in Wall. L. n.* 4073.—Melastoma asperum, *Linn. sp. p.* 560; *Don! in Wern. Soc. trans.* 4. *p.* 288; *DC. prod.* 3. *p.* 145; *Spr. syst.* 2. *p.* 295.—*Rheed. Mal.* 4. *t.* 43?; *Rumph. Amb.* 4. *t.* 71?.——Malabar coast.

Neither of the above figures convey any idea of our plant; but that ours is the Linnæan species we have the authority of Mr D. Don, who indeed was so kind as look over and name all the specimens of this and the following genera in the order in our Peninsular herbarium. In Dr Wight's herbarium is another species (*O. Kleinii*, W. & A.) closely allied, from Trincomalee in Ceylon, gathered by Klein in January 1796, but the specimens are very imperfect: the leaves are 5-nerved, slightly strigose and oblong-lanceolate, and resemble a good deal those in Rumph's and Rheede's plates above mentioned:

Digitized by Google

the flowers are in a short terminal raceme; the calyx-tube cup-shaped, the lower part covered with adpressed bristly pubescence, the upper sprinkled with short scales that are ciliated at the apex with long spreading bristles; the segments (5) are lanceolate, shortly ciliated, hirsute and keeled along the back, glabrous between the keel and the margins, and crowned, as well as the linear appendages, with stellate bristles.

III. MELASTOMA. *Linn.; Don; DC.*

Calyx-tube ovate, often clothed with scales: limb 5- (or rarely 4–6-) cleft, the lobes deciduous, with small appendages arising from the outside between the lobes. Petals as many as the calyx-lobes. Stamens twice as many as the petals and dissimilar, rarely only as many: anthers beaked, opening by a single pore; the connectivum in those that alternate with the petals is short and 2-lobed at the base: in those that are opposite the petals elongated-linear (resembling a second stalk or filament to the anthers), and 2-spurred at the very base. Ovary crowned with bristles. Stigma pruinose. Capsule 5- (or rarely 4- or 6-) celled. Seeds cochleate.—Shrubs, usually hispid from bristles. Leaves petioled, 3–7-nerved. Peduncles axillary or terminal. Flowers large, white, red or purple.

1001. (1) M. *Malabathricum* (Linn.:) shrubby: branches 4-angled, extreme ones compressed, rough from adpressed bristles or scales: leaves elliptic-oblong, somewhat acute, obtuse at the base, quite entire, green on both sides; upper side strigose from rigid flat bristles; under hirsute on the nerves and veins, harshly pubescent between them: corymbs terminal, 1–5-flowered, sessile or nearly so; flowers surrounded with large ovate-cordate deciduous bracteoles: calyx-tube copiously clothed with small adpressed lanceolate toothed scales; lobes ovate, acute.—*Linn. sp. p.* 559; *DC. prod.* 3. *p.* 145; *Spr. syst.* 2. *p.* 299; *Roxb. fl. Ind.* 2. *p.* 405; *Wall.! L. n.* 4040; *Wight! cat. n.* 1150.—*Rheed. Mal.* 4. *t.* 52; *Rumph. Amb.* 4. *t.* 72.

† 1002. (2) M. *polyanthum* (Benth.)—*Wall. L. n.* 4051.

IV. TRIPLECTRUM. *Don. mst.*

Calyx fleshy, somewhat infundibuliform, truncated at the margin. Petals 3; two oblong, obtuse, recurved; the third (formed of two united) broadly obovate, emarginate. Stamens 8, all similar: anthers oblong-linear, elongated but not beaked, opening by a terminal pore; connectivum produced at the base into three short blunt spurs, two in front of the filament, the other behind it. Ovary free, stalked, oval, glabrous. Style slender, subulate, curved.—Shrubby, glabrous, throwing out roots from the joints. Leaves roundish-oval, fleshy, 3-nerved, quite entire, on short petioles: frequently there is only one pair on a short lateral branchlet, opposite to which springs the solitary 1-flowered peduncle.

A most remarkable plant, of which we have not yet seen the fruit. It is closely allied to *Medinilla*, Gaud., which Blume has lately increased with upwards of twenty species, but differs from all of that genus by the union of the two upper petals.

1003. (1) T. *radicans* (Don! mst.)—*Wight! cat. n.* 1151.

V. PTERNANDRA. *Jack.*

Calyx-tube ovate; limb obsoletely 4-toothed or almost entire. Petals 4. Stamens 8, equal: anthers introflexed, compressed, spurred behind at the

Digitized by Google

base, 2-celled; the cells anteriorly gibbous and bursting longitudinally. Ovary adnate to the tube of the calyx, 4-celled, many-ovuled. Style single, declinate, about as long as the stamina. Stigma conical and rather obtuse: capsule fleshy, 4-celled, many-seeded. Placentæ as many as the cells, convex, parietal.—Shrubs or trees. Leaves opposite, 3-nerved. Flowers panicled, corymbose, or somewhat capitate.

The new genus without a name in Roxburgh's Flora Indica, v. 2. p. 225, seems to be the same as the present. *Astronium* of Blume appears also very closely allied, but to differ by having a peltate stigma, 5–6 petals, 10–12 stamens, and the placenta situated at the base of each cell.

* 1004. (1) P. *capitellata* (Jack:) flowers sessile, collected into little heads. —*Jack in Mal. misc.* 2. *app. p.* 3; *Wall.? L. n.* 4079.

The above character is taken from Jack's paper, but Dr Wallich is uncertain whether the specimen from the Madras herbarium be the same: we have seen neither.

ORDER LXIII.—ALANGIEÆ. *DC.*

Calyx campanulate, 5–10-toothed. Petals as many as the segments of the calyx, linear, reflexed: æstivation twisted. Stamens long, exserted, once, twice, or four times as many as the petals: filaments distinct: anthers introrse, two-celled, often sterile. Ovarium globose, cohering with the tube of the calyx, 1–2-celled: ovules solitary, pendulous: style 1, subulate, expanded at the base into a thick coloured fleshy disk covering the top of the ovary: stigma dilated. Berry (balausta) oval, coherent with the tube of the calyx, and somewhat crowned by its limb, fleshy, slightly ribbed, 1–2-celled: endocarp sometimes osseous, and separating from the sarcocarp like a putamen. Seeds solitary, pendulous. Albumen fleshy. Embryo straight: radicle superior: cotyledons flat, foliaceous.—Trees. Leaves alternate, exstipulate, entire, not dotted. Flowers few, axillary, fascicled, shortly pedunculed.

The portion of the torus between the calyx and ovary, to which the stamens and petals are attached, is of a different colour and texture from the above-mentioned epigynous disk, which induces us to refer the latter to the style, not to the torus.

I. ALANGIUM. *Lam.*—Angolamia, *Scop.*

Calyx 5–10-toothed. Petals 5–10. Stamens twice or more times as many as the petals: filaments very hairy towards the base. Ovary 1-celled: ovule solitary. Drupe 1-seeded.—Some of the branches occasionally become spinescent. Young branches, petioles, and nerves, puberulous. Leaves obtuse or acute and nearly equal at the base, reticulated on the under side with transverse veins.

1005. (1) A. *decapetalum* (Lam.:) leaves narrow-oblong, sometimes shortly and bluntly acuminated: petals 6–10.—*Lam.; DC. prod.* 3. *p.* 203; *Spr. syst.* 2. *p.* 602; *Wall.! L. n.* 6884; *Wight! cat. n.* 1062, 1063.—A. hexapetalum, *Roxb. fl. Ind.* 2. *p.* 502; *in E. I. C. mus. tab.* 230.—A. tomentosum, *Lam.; DC. prod.* 3. *p.* 204; *Spr. syst.* 2. *p.* 602; *Wall.? L. n.* 6885.—*Rheed. Mal.* 4. *t.* 17.

Digitized by Google

1006. (2) A. *hexapetalum* (Lam.:) leaves elliptic or ovate-lanceolate, with a longish sudden acumination; petals 6–7.—*DC. prod.* 3. *p.* 203; *Spr. syst.* 2. *p.* 602; *Wall.! L. n.* 6883; *Wight! cat. n.* 1064.—*Rheed. Mal.* 4. *t.* 26.

ORDER LXIV.—MYRTACEÆ. *Juss.*

Calyx 4–5–6–8-cleft, the limb sometimes cohering in two portions, sometimes in one and then falling off like a cap or lid. Petals perigynous, as many as the segments of the calyx and alternating with them, sometimes slightly united at the very base; rarely wanting: æstivation imbricated. Stamens inserted with the petals, rarely as few, sometimes twice as many, usually indefinite: filaments either all distinct, or monadelphous, or variously polyadelphous, in æstivation curved inwards: anthers ovate, bilocular, small, bursting longitudinally. Ovarium cohering with the tube of the calyx, formed of two or more carpels, the dissepiments rarely imperfect, and hence 1- to 15-celled: style and stigma simple. Placentæ in the axis. Fruit dry or fleshy, dehiscent, or indehiscent, 2–6- or many-celled, or by the obliteration of the dissepiments 1-celled. Seeds rarely solitary or few, usually indefinite. Albumen 0. Embryo straight or curved: radicle next the hilum: cotyledons distinct, or sometimes consolidated into one mass with the radicle.—Trees or shrubs. Leaves usually opposite, entire, and with transparent dots, sometimes alternate, rarely serrated, and rarely without dots.

I. MELALEUCA. *Linn.; Lam. ill. t.* 641; *Gærtn. fr.* 1. *t.* 35.

Calyx-tube nearly hemispherical; limb 5-partite. Petals 5. Stamens numerous, combined into 5 elongated bundles, that alternate with the petals. Anthers incumbent. Style filiform. Stigma obtuse. Capsule connate with and inclosed in the thickened tube of the calyx, which is sessile on and adnate at its base to the flower-bearing branch, 3-celled, many-seeded. Seeds angular.—Trees or shrubs. Leaves alternate or opposite, quite entire, equal at the base. Flowers perfectly sessile or somewhat combined with the branch, arranged in spikes or heads, whitish or yellowish or purplish.

*1007. (1) M. *cajuputi* (Roxb.:) arborescent: branchlets pendulous: leaves alternate, elliptic or narrow-lanceolate, more or less acute, slightly falcate, 5-nerved: flowers a little distant, forming spikes: rachis, calyx, and young branches, densely pubescent or almost villous.—*Roxb. hort. Bengh. p.* 59; *fl. Ind.* 3. *p.* 394; *Wight! cat. n.* 1065.—M. minor, *Sm. in Rees' cycl.* (*but not* Arbor alba minor *of Rumphius*); *DC. prod.* 3. *p.* 212; *Wall. L. n.* 3645.—M. Leucadendron, *Lam. ill. t.* 641. *f.* 4 (not *Linn.*).—Arbor alba Javanica, *Rumph. Amb.* 2. *p.* 74.

This alone yields the cajeput oil, from which circumstance, as well as from its not being the *Arbor alba minor* described and figured by Rumphius (although that synonym be quoted by Smith and De Candolle), we have adopted the name given by Roxburgh. *M. minor* appears to be a shrub, with 3-nerved leaves, and perhaps not known to any botanist of the present day: Hamilton (in Wern. soc. tr. 6. p. 301) refers to it Rumph. Amb. 2. t. 17. f. 1. with

Digitized by Google

all the description. We ought, however, to state that Roxburgh in his specific character mentions the leaves to be oftener 3- than 5- nerved in his *M. cajuputi*; perhaps he borrowed this from Rumphius' *M. minor*, supposed by him to be the same, for in the description he does not say so. Hamilton (l. c.) supposes Rumph. Amb. t. 17. f. 2. to be *Metrosideros saligna*, but that is a New Holland plant; we rather suspect it to be another species of *Melaleuca*.

II. SONNERATIA. *Linn.; Lam. ill. t.* 420.—Aubletia. *Gærtn. fr.* 1. *t.* 78.

Calyx campanulate, 4–6-cleft, cohering with the ovary at the very base: lobes acute: æstivation valvular. Petals 4–6, alternating with the lobes of the calyx, or wanting. Stamens numerous: filaments distinct: anthers roundish. Style filiform. Stigma large, peltate. Fruit baccate, adnate by its base to the permanent calyx and thus appearing half superior, nearly globose, many-celled: rind membranaceous, cells 10–15, separated by thin dissepiments. Seeds numerous, nestling in a fleshy pulp, curved. Embryo curved: radicle long: cotyledons short, unequal, foliaceous, convolute.—Small trees. Leaves opposite, quite entire, thickish, 1-nerved, almost veinless, not dotted. Flowers ternal, usually solitary, large.

1008. (1) S. *acida* (Linn.:) branchlets 4-angled: leaves oval-oblong: petals 6, narrow-lanceolate: stigma concave.—*DC. prod.* 3. *p.* 231; *Spr. syst.* 2. *p.* 493; *Lam. ill. t.* 420; *Roth, nov. sp. p.* 233; *Roxb. fl. Ind.* 2. *p.* 506; *in E. I. C. mus. tab.* 947; *Wall. L. n* 3641.—Rhizophora caseolaris, *Linn.*—*Rheed. Mal.* 3. *t.* 40; *Rumph. Amb.* 3. *t.* 74.——Malabar.

* 1009. (2) S. *apetela* (Ham.:) branches terete: leaves elliptic-oblong, a little attenuated at the base: flowers 4-cleft: petals none: stigma conical, obtuse.—*Ham. in Syme's emb. to Ava*, 3. *p.* 313. *t.* 25; *DC. prod.* 3. *p.* 231; *Spr. syst.* 2. *p.* 493; *Heyne in Roth, nov. sp. p.* 233; *Roxb. ! fl. Ind.* 2. *p.* 506; *in E. I. C. mus. tab.* 1144; *Wall. ! L. n.* 3642.

III. PUNICA. *Tourn.; Gærtn. fr.* 1. *t.* 38; *Lam. ill. t.* 415.

Calyx turbinate, 5–7-cleft: æstivation valvular. Petals 5–7. Stamens numerous: filaments distinct. Style filiform. Stigma capitate. Fruit large, globose, crowned by the somewhat tubular limb of the calyx, baccate, indehiscent, covered with the tube of the calyx, divided horizontally into two parts by a dissepiment: the lower division 3-celled, the upper 5–9-celled; dissepiments membranaceous: placentæ in the lower division at the bottom; in the upper stretching from the side of the fruit to the middle. Seeds numerous, nestling in a pellucid pulp. Embryo oblong: radicle short, acute; cotyledons foliaceous, spirally convolute.—Small trees or shrubs with spinescent branchlets. Leaves deciduous, opposite, rarely verticillate or alternate, often axillary and fascicled, oblong, quite entire, not dotted. Flowers 2–3, nearly sessile on somewhat terminal branchlets, usually scarlet.

This genus only differs from the other *Myrtaceæ* by having two verticels of carpels developed instead of one, and perhaps in a truly wild state the upper or adventitious one may occasionally disappear. The inner series (or those at the bottom of the fruit) have their placentæ in the axis; but the outer series, forced to the top of the fruit by the contraction of the mouth of the tube of the calyx, having their placentæ in the ovary at the back of the inner carpels, exhibit them in the ripe fruit in a horizontal position on the upper surface of the lower cells.

1010. (1) P. *Granatum* (Linn.:) arborescent: leaves oblong inclining to

Digitized by Google

lanceolate.—*DC. prod.* 3. *p.* 3; *Spr. syst.* 2. *p.* 490; *Roxb. fl. Ind.* 2. *p.* 499; *Wall. L. n.* 3659; *Wight! cat. n.* 1066.

IV. PSIDIUM. *Linn.; Lam. ill. t.* 416.—Guaiava. *Gærtn. fr.* 1. *t.* 38.

Calyx-tube ellipsoidal or obovate, often contracted at the apex: limb in æstivation undivided and ovate, afterwards 1–5-cleft. Petals 5. Stamens numerous, distinct, crowded and inserted in a broad ring over almost the whole undivided portion of the limb of the calyx. Style filiform. Stigma capitate. Ovary 5–20-celled, each cell divided into two by means of a placenta, that resembles a dissepiment and is cleft at the margin, some of them occasionally abortive: ovules numerous, horizontal, attached to the margin of the placenta. Fruit baccate, covered with the tube of the calyx and crowned by its lobes, many-seeded. Seeds in the ripe fruit nestling within a pulp: testa bony. Embryo curved like a horse shoe: radicle longish: cotyledons minute.—Trees or shrubs. Leaves opposite, quite entire, feather-nerved; not dotted. Peduncles axillary, 1–3-flowered, bibracteated. Flowers white.

* 1011. (1) P. *pumilum* (Vahl:) small shrub: branchlets 4-angled: leaves lanceolate, acute; upper side glabrous; under tomentose, with the nerves prominent: pedicels 1-flowered, shorter than the leaf: fruit globose.—*Vahl, symb.* 2. *p.* 56; *DC. prod.* 3. *p.* 232; *Spr. syst.* 2. *p.* 489.—P. angustifolium, *Lam.*—P. Cujavillus, *Burm.; Wall. L. n.* 3655.—P. caninum, *Lour.*

1012. (2) P. *pyriferum* (Linn.:) arborescent: branchlets 4-angled: leaves elliptical, slightly acute, marked by the prominent nerves, densely pubescent beneath: pedicels 1-flowered: fruit turbinate.—*DC. prod.* 3. *p.* 233; *Spr. syst.* 2. *p.* 488; *Roxb. fl. Ind.* 2. *p.* 480; *Wall.! L. n.* 3657; *Wight! cat. n.* 1067.—Guaiava pyriformis, *Gærtn. fr.* 1. *t.* 38.—*Rheed. Mal.* 3. *t.* 34; *Rumph. Amb.* 1. *t.* 47.——Malabar. Nopalry.

1013. (3) P. *pomiferum* (Linn.:) arborescent: branchlets 4-angled, leaves oval- or oblong-lanceolate, pubescent beneath: peduncles 3- or many-flowered: fruit globose.—*DC. prod.* 3. *p.* 234; *Spr. syst.* 2. *p.* 489; *Roxb. fl. Ind.* 2. *p.* 480; *Wall.! L. n.* 3658.—*Rheed. Mal.* 3. *t.* 35; *Rumph. Amb.* 1. *t.* 48; *Pluk. t.* 193. *f.* 4.——Malabar.

V. MYRTUS. *Linn.; Gærtn. fr. t.* 38.

Calyx-tube somewhat globose: limb 5- or very rarely 4-partite. Petals 5, or very rarely 4. Stamens distinct. Berry 2–3-celled, somewhat globose, crowned with the segments of the calyx. Seeds (ripe) in each cell several, or very rarely solitary, reniform: testa bony. Embryo curved: cotyledons semicylindrical, very short: radicle twice the length of the cotyledons,—Shrubs. Leaves opposite, quite entire, pellucid dotted. Peduncles axillary, 1- or rarely 3-flowered.

1014. (1) M. *tomentosa* (Ait.:) branches downy: leaves ovate, 3-nerved, the lateral nerves near the margin, upper side when young downy, under tomentose and hoary: peduncles 1- (or occasionally 3-) flowered, bearing 2 ovate bracteoles under the flower: calyx downy, 5-cleft: petals slightly downy on the outside: berry 3-celled: seeds compressed, forming two rows in each cell.—*DC. prod.* 3. *p.* 240; *Spr. syst.* 2. *p.* 480; *Roxb. fl. Ind.* 2. *p.* 498; *in E. I. C. mus. tab.* 1442; *Wall.! L. n.* 3630; *Wight! cat. n.* 1068.—M. canescens, *Lour.; Roxb. fl. Ind.* 2. *p.* 498 (kept distinct by an error of the press).—*Pluk. t.* 372. *f.* 1.——Neelgherries.

Digitized by Google

VI. SYZYGIUM. *Gærtn. fr.* 1. *t.* 33.

Calyx-tube obovate: limb nearly entire or repand-lobed. Petals 4–5, roundish, in æstivation forming a calyptra or lid, and falling off either in that state from the calyx, or immediately after expansion. Stamens numerous, distinct. Ovary 2-celled, with several ovules in each cell. Style 1. Stigma simple. Berry 1-celled, 1- or few-seeded. Seed globose. Cotyledons large, fleshy, nearly hemispherical: radicle small, inserted between the cotyledons below their middle, and concealed by them.—Trees or shrubs. Leaves opposite, quite entire, glabrous. Peduncles axillary or terminal, cymose or corymbose.

1015. (1) S. *Jambolanum* (DC.:) arborescent: leaves oval or oblong, more or less acuminated or obtuse, feather-nerved, coriaceous: cymes panicled, lax, usually lateral on the former year's branches, occasionally axillary or terminal: calyx shortly turbinate, truncated: berry olive-shaped, often oblique.—*DC. prod.* 3. *p.* 259; *Wall. L. n.* 3560; *Wight! cat. n.* 1069.—S. caryophyllifolium, *DC. prod.* 3. *p.* 260; *Wall.! L. n.* 3562.—Eugenia Jambolana, *Lam. enc. meth.* 3. *p.* 198; *Roxb. fl. Ind.* 2. *p.* 484; *Ham. in Wern. soc. trans.* 5. *p.* 342.—E. Jambolifera, *Roxb. in E. I. C. mus. tab.* 156.—E. obtusifolia, *Roxb. fl. Ind.* 2. *p.* 485.—E. caryophyllifolia, *Lam. l. c.*—Calyptranthes Jambolana, *Willd. sp.* 2. *p.* 975; *Spr. syst.* 2. *p.* 500 (char. bad).—C. caryophyllifolia, *Willd l. c.* (excl. syn. *Rumph.* and *Burm.*); *Spr. l. c.*—Myrtus Cumini, *Linn. sp. p.* 674 (excl. syn.); *Burm. Ind. p.* 115 (excl. syn. *Rumph.* and *Burm.*) —Madan, *Burm. Zeyl. p.* 197.—*Pluk. t.* 274. *f.* 2; *Rheed. Mal.* 5. *t.* 29; *Rumph. Amb.* 1. *t.* 42.——Travancore. Malabar. Coromandel.

Dr Hamilton has some valuable observations on the synonyms of this plant, in which we entirely coincide. We have not deemed it necessary to split the species into varieties taken from the shape of the leaves, as they vary exceedingly, probably from being very much cultivated: we have some before us oblong-lanceolate, and attenuated at the base, some ovate-acuminated and rounded at the base, others elliptical with either a very short sudden blunt acumination or none at all: the last mentioned is the type of *Eug. Jambolana*, Lam.; the first, of his *E. caryophyllifolia;* but we have many intermediate gradations. We have not seen the fruit of *E. caryophyllifolia*, Roxb. fl. Ind. 2. p. 486 (*E. calyptrata*, Roxb. in E. I. C. mus. tab. 1142); it is described and figured as much smaller and globular: but the specimens from Roxburgh which we possess shew no difference whatever.

1016. (2) S. *densiflorum* (Wall.:) leaves elliptic oblong, acuminated, folded, coriaceous, dotted: cyme dense, corymbose; peduncles lateral, general and partial stout, the partial ones short and bearing at the apex an umbel of 8–12 almost sessile flowers subtended by oblong-linear caducous bracteas: calyx shortly turbinate; limb cup-shaped, shortly and bluntly 4-toothed or lobed: petals expanded before falling off.—*Wall.! L. n.* 3601; *Wight! cat. n.* 1070.——Neelgherries.

This is very closely allied to *S. inophyllum*, DC., the flowers being of the same size and similar in appearance. We have only seen specimens without fruit.

1017. (3) S. *caryophyllæum* (Gærtn.:) leaves obovate, obtuse or with a very short sudden blunt acumination, tapering towards the base, somewhat coriaceous, inconspicuously dotted; the upper side becoming black by drying: cymes corymbose, trichotomous, terminal, lax: calyx shortly turbinate, inconspicuously repand or 4-toothed: fruit globose, 1-seeded.—*Gærtn. fr.* 1. *t.* 33; *DC. prod.* 3. *p.* 260; *Wall.! L. n.* 3563; *Wight! cat. n.* 1071.—Calyptranthes caryophyllata, *Pers.*—Myrtus caryophyllata, *Linn.; Spr. syst.* 2.

Digitized by Google

p. 487.—Eugenia corymbosa, *Lam. enc. meth.* 3. *p.* 199; *DC. prod.* 3. *p.* 284. —*Rheed. Mal.* 5. *t.* 27.

We do not know the *Myrtus Androsæmoides* of Vahl, from Ceylon: it appears, however, to belong to *Syzygium* and to be very near the present species. De Candolle (l. c. p. 284) refers it to *Eugenia:* Poiret's plant of that name is *Myonima multiflora*, Ait.

1018. (4) S. *rubicundum* (W. & A.:) shrubby: leaves narrow-oblong, attenuated at both ends, obtuse at the very point, coriaceous, pellucid-dotted, striated with numerous parallel transverse veins: cymes corymbose, terminal, longer than the leaves: flowers minute: calyx repand, 4-lobed, shortly turbinate.—*Wight! cat. n.* 1072.

1019. (5) S. *Wightianum* (Wall.:) leaves elliptic-oblong, slightly tapering at both ends, thinly coriaceous, inconspicuously dotted, marked beneath with the transverse veins: flowers scarcely pedicellate, about 3 together at the apex and 2–3 at the side of each peduncle; the peduncles arranged on the leafless branches or shoots, so as to form a narrow racemose cyme: calyx glabrous, elongated, clavate, slightly repand 5-lobed.—*Wall.! L. n.* 3577; *Wight! cat. n.* 1073.——Dindygul hills.

1020. (6) S. *Zeylanicum* (DC.:) arborescent: leaves ovate or oblong, much acuminated, coriaceous, shining on the upper side, scarcely dotted: flowers shortly pedicellate, forming axillary or terminal compound cymes that are often arranged in a kind of contracted raceme or spike: calyx pruinose, elongated, clavate, repand 5-lobed: berry (white) globose, 1-seeded. —*DC. prod.* 3. *p.* 260; *Wall.! L. n.* 3564; *Wight! cat. n.* 1074.—S. spicatum, *DC. l. c.*—S. Bellutta, *DC. l. c. p.* 261.—Myrtus Zeylanica, *Linn. sp. p.* 675; *Spr. syst.* 2. *p.* 488.—Eugenia spicata, *Lam. enc. meth.* 3. *p.* 201.— *Rheed. Mal.* 5. *t.* 20 (not good).

†1021. (7) S. *lanceolatum* (W. & A.:) leaves lanceolate, almost sessile, glabrous but not shining, pellucid-dotted: peduncles terminal and lateral, branched, few-flowered: calyx turbinate, 4-lobed.—Eugenia lanceolata, *Lam. enc. meth.* 3. *p.* 200; *DC. prod.* 3. *p.* 284.—Myrtus Sonneratii, *Spr. syst.* 2. *p.* 485.

Probably a poor specimen of *S. Jambolanum.*

† 1022. (8) S. *fruticosum?* (DC.)—*Wall. L. n.* 3559.—*Herb. Heyne.*

† 1023. (9) S. *lineare* (Wall.)—*Wall. L. n.* 3596.—*Herb. Heyne.*

† 1024. (10) S. *salicifolium* (Wall.)—*Wall. L. n.* 3597.—*Herb. Heyne?* Perhaps the same as our *S. rubicundum.*

† 1025. (11) S. *Heyneanum* (Wall.)—*Wall.! L. n.* 3599.—Calyptranthus caryophyllata, var. *herb. Heyne.*

VII. EUGENIA. *Linn.*

Calyx-tube nearly globose: limb divided down to the ovary into 4 or rarely 5 segments. Petals 4, or rarely 5. Stamens numerous, distinct. Ovary 2-celled; the cells often divided by the large placentæ reaching almost to the sides and there split into two divaricating segments bearing the ovules: ovules several in each cell. Berry nearly globose, crowned by the segments of the calyx, at length 1-, or rarely 2-celled. Seeds 1–2, large. Cotyledons very thick and fleshy, partially or completely combined into one mass with the radicle: radicle very short, scarcely distinguishable.—Trees or shrubs. Leaves opposite, quite entire, pellucid-dotted. Peduncles axillary or terminal, solitary or several together, simple and 1-flowered, or racemose-cymose, or panicled.

Digitized by Google

1026. (1) E. *Rottleriana* (W. & A.:) much branched: young shoots, petioles, peduncles and calyx, covered with rusty silky tomentum: leaves very narrow-lanceolate, tapering at both ends, obtuse at the point, glabrous on both sides except while very young, pellucid-dotted: peduncles axillary or somewhat lateral, 3–4-together, sometimes solitary, filiform, scarcely one-fourth of the length of the leaves: bracteoles 2 under the calyx: calyx-segments 4, triangular-ovate, obtuse: petals 4, much longer than the calyx, villous on the margin: stigma simple, acute.—*Wight! cat. n.* 1075.

1027. (2) E. *bracteata* (Roxb.:) shrubby: young shoots, petioles, peduncles and calyx clothed with a rusty pubescence: leaves ovate-oblong, tapering or cuneate at the base, obtuse or with a short blunt acumination, at first slightly downy, at length quite glabrous and shining above, pellucid-dotted: peduncles usually axillary or sometimes terminal, short, 1-flowered, longer than the petioles, 1–4-together, with 2 small bracteoles under the calyx: calyx-segments 4, unequal, linear-oblong, obtuse, ciliated: petals 4: style slender: fruit globose, glabrous, 1–2-seeded.—*Roxb. fl. Ind.* 2. *p.* 490: *DC. prod.* 3. *p.* 264; *Wight! cat. n.* 1076.—E. Roxburghii, *DC. prod.* 3. *p.* 271; *Wall.! L. n.* 3621; *Wight! in Hook. journ. of bot.* 1. *p.* 66. *t.* 124.—E. Zeylanica, *Roxb. l. c.* (according to Wallich).—E. læta, *Ham. in Wern. soc. trans.* 5. *p.* 338.—Myrtus bracteata, *Willd. sp.* 2. *p.* 969; *Spr. syst.* 2. *p.* 480.—M. littoralis, *Roxb. in E. I. C. mus. tab.* 151.—M. Coromandeliana, *Koen.*—M. ruscifolia, *Willd. sp.* 2. *p.* 970 (description bad); *DC. prod.* 3. *p.* 241; *Spr. syst.* 2. *p.* 482.—M. latifolia, *Heyne in Roth, nov. sp. p.* 232.—M. Heynei, *Spr. syst.* 2. *p.* 482; *DC. prod.* 3. *p.* 241.—*Pluk. t.* 427. *f.* 3.——Very common on all the Coromandel coast near the sea-shore.

†1028. (3) E. *Zeylanica* (Willd.;) leaves shortly petioled, oblong, narrowed at the base, acuminated with the point blunt, coriaceous, shining, veined, not dotted: peduncles filiform, 1-flowered, solitary or in pairs, axillary or on the leafless branchlets, with two short subulate bracteoles under the calyx.—*Willd. sp.* 2. *p.* 963.—E. Willdenowii, *DC. prod.* 3. *p.* 265; *Wall.? L. n.* 3623.—Myrtus Willdenowii, *Spr. syst.* 2. *p.* 480.

Dr Wallich, in his List, n. 3623. *c*, quotes *E. ruscifolia* of Wight's herbarium, on which account we feel doubtful about his plant, no specimen among Dr Wight's collections agreeing with Willdenow's character.

1029. (4) E. *subcordata* (W. & A.:) branches terete: leaves shortly petioled, ovate, a little acuminated with the point blunt, slightly cordate at the base, glabrous, shining on the upper side, pellucid-dotted: peduncles axillary, fascicled, 2–10 together, filiform and slender, about half as long as the leaves, drooping, usually without bracteoles under the calyx or occasionally with one subulate and caducous: calyx glabrous: segments 4, orbicular, villous on the margin: petals 4, orbicular: style filiform; stigma pointed.—*Wight! cat. n.* 1077.

*1030. (5) E. *acris* (W. & A.:) arborescent, glabrous: young branches acutely 4-angled: leaves elliptic-oval, obtuse, more or less convex, coriaceous, very glabrous, upper side reticulated with elevated veins, finely pellucid-dotted: peduncles compressed, axillary and terminal, trichotomous, corymbose, rather longer than the leaves: calyx-limb 5-partite!, segments roundish: style filiform, acute: berry globose, 1–4-seeded.—*Wight! cat. n.* 1078.—E. Pimenta, β ovalifolia, *DC. prod.* 3. *p.* 285; *Wall. L. n.* 3624.—Myrtus acris, *Swartz; Spr. syst.* 2. *p.* 487.—M. Pimenta var. latifolia, *Roxb.! hort. Bengh. p.* 37.—M. aromatica, *Poir. enc. meth.* 4. *p.* 410.—M. caryophyllata, *Jacq.*—Myrcia acris, *DC. prod.* 3. *p.* 243; *Hook.! in Bot. mag. t.* 3153.—M. Pimentoides, *DC. l. c.—Pluk. t.* 155. *f.* 3.——Courtallum.

An analysis of the seed, even although far from ripe, shows this to belong to *Eugenia* and not to *Myrcia*, in which the cotyledons ought to be foliaceous and crumpled. De Candolle states that he had not seen the fruit, a circumstance which must have escaped Dr Hooker when he wrote his obser-

Digitized by Google

vations on this plant in the Bot. Magazine. We are at a loss to understand Dr Hooker's dissections and description of the ovarium: we have examined *Myrcia acris* from the West Indies, and find a 2-celled ovary with the placentæ extending nearly to the side, thus dividing each cell into two: Roxburgh's specimens of his *Myrtus Pimenta latifolia* exhibit the same structure; and, indeed, we are unable to point out any difference between these species: in both, the leaves are convex and pellucid-dotted, though sometimes obscurely. De Candolle has misplaced the synonyms of Poiret; that author's *Myrt. aromatica* belonging to *E. acris*, and his *M. citrifolia* (not seen by him, but described with lanceolate leaves and 4-fid flowers, and taken up principally from Linnæus's account of his *M. Pimenta*) to *E. Pimenta*.

† 1031. (6) E. *cuneata* (Wall.)—*Wall.! L. n.* 3625.—Myrtus cuneata, *Heyne; herb. Madr.*——Courtallum.

VIII. JAMBOSA. *Rumph.; DC.*

Calyx-tube turbinate, attenuated at the base; the throat produced beyond the ovary, dilated, obovate: limb 6–4-cleft; lobes roundish. Petals 4, inserted on the top of the throat of the calyx, broad, concave, obtuse. Stamens very numerous, longer than the petals, distinct, straight. Ovary 2-celled: ovules numerous. Style filiform. Stigma simple, slightly acute. Fruit grumose-fleshy, crowned by the limb of the calyx, 1–2-seeded. Seeds angled. Cotyledons between fleshy and horny, thick, united by their margins: radicle somewhat cylindrical, concealed between the cotyledons.—Trees. Leaves opposite, quite entire, shortly petioled, pellucid-dotted. Cymes lateral and terminal, much shorter than the leaf, few-flowered, simple, the lateral pedicels opposite, the terminal one solitary. Flowers large, jointed with the top of the pedicel, without bracteoles. Fruit large, eatable.

1032. (1) J. *vulgaris* (DC.:) leaves narrow-lanceolate, attenuated at the base, acuminated towards the apex: racemes cymose, terminal: (flowers white): fruit globose.—*DC. prod.* 3. *p.* 286; *Wight! cat. n.* 1079.—Eugenia Jambos, *Linn. sp. p.* 672; *Roxb. fl. Ind.* 2. *p.* 494; *in E. I. C. mus. tab.* 1068; *Wall.! L. n.* 3615.—Myrtus Jambos, *H. B. K.; Spr. syst.* 2. *p.* 485.—*Rheed. Mal.* 1. *t.* 17.

* 1033. (2) J. *alba* (W. & A.:) leaves almost quite sessile, elliptic-oblong: peduncles lateral and terminal, brachiate, several-flowered: (flowers white): fruit turbinate, depressed.—J. macrophylla, *DC. prod* 3. *p.* 386 (excl. syn.) *Lam.* and *Rumph.*—Eugenia alba, *Roxb.! fl. Ind.* 2. *p.* 493; *Wall. L. n.* 3614, *c.*

* 1034. (3) J. *aquea* (DC.:) leaves almost sessile, oblong-lanceolate, narrower and somewhat cordate at the base: peduncles terminal or from the upper axils, 8–7-flowered: (flowers white); fruit turbinate, flattened at both ends.—*DC. prod.* 3. *p.* 288; *Wight! cat. n.* 1080.—Eugenea aquea, *Roxb. fl. Ind.* 2. *p.* 492; *in E. I. C. mus. tab.* 1439; *Wall.! L. n.* 3613.—E. malaccensis, *Lour.* (not *Linn.*)—*Rumph. Amb.* 1. *t.* 38. *f.* 2. (bad); *and t.* 39 ?

We suspect that *Eugenia alba*, Wall. L. n. 3614, *a*, *b*, belongs to this, and not to the true *J. alba*. Rumph's *t.* 38. *f.* 2, judging from the 4-cleft stigma, may possibly be compounded of a species of *Careya:* his figure of the fruit, however, we do not understand.

* 1035. (4) J. *malaccensis* (DC.:) leaves oblong-lanceolate, attenuated at the base: cymes lateral, short, usually sessile or very shortly peduncled, fascicled: (flowers red): fruit (large) turbinate.—*DC. prod.* 3. *p.* 286; *Wight! cat. n.* 1081.—J. purpurascens, *DC. l. c.* (excl. syn. *Roxb.*)—J. domestica, *DC. l. c. p.* 288.—Eugenia malaccensis, *Linn. sp. p.* 672; *Lam. enc.*

Digitized by Google

meth. 3. *p.* 196; *Roxb. fl. Ind.* 2. *p.* 483; *in E. I. C. mus. tab.* 1067; *Wall.! L. n.* 3611.—E. macrophylla, *Lam. l. c.*—Myrtus Malaccensis, *Spr. syst.* 2. *p.* 484.—M. macrophylla, *Spr. l. c. p.* 483.—*Rheed. Mal.* 1. *t.* 18; *Rumph. Amb.* 1. *t.* 37, *and t.* 38. *f.* 1.

De Candolle, by some mistake, ascribes to this white flowers, referring the specimens with red to his *J. purpurascens:* but the *J. purpurea*, W. & A., or *Eugenia purpurea*, Roxb. (fl. Ind. 2. p. 483, and in E. I. C. mus. tab. 1438), differs by the fruit being purplish and exactly oval, without any reference to the colour of the blossoms.

IX. BARRINGTONIA. *Forst.; Gærtn. fr.* 2. *t.* 101.—Butonica. *Lam. ill. t.* 590. *and* 591.—Stravadium. *Juss.*—Meteorus. *Lour.*

Calyx-tube ovate: limb 2–3–4-partite; lobes ovate, obtuse, concave, persistent. Petals 4, coriaceous, attached to the ring at the base of the stamens. Stamens numerous, in several rows: filaments filiform, long, distinct, combined at the base into a short ring, all bearing anthers. Ovary 2–4-celled, surmounted by an urceolus sheathing the base of the style: ovules 2–6 in each cell. Style filiform. Stigma simple. Fruit fleshy, more or less 4-angled, crowned by the limb of the calyx, 1-celled. Seed solitary. Embryo large, fleshy, not separable into cotyledons and radicle, formed of two concentric homogeneous combined layers.—Trees. Leaves crowded about the ends of the branches, opposite or verticillate, obovate, quite entire or crenated or serrated, without pellucid dots. Flowers racemose.

* 1036. (1) B. *speciosa* (Linn.:) leaves shining, cuneate-oblong, obtuse, quite entire: flowers (large) forming a lax simple raceme or thyrsus: pedicels elongated, several times longer than the flower, 1-bracteated at the base: calyx 2–3-cleft: ovary 4-celled, two of the dissepiments being often imperfect in the middle: ovules attached to the inner angle of the cell, near its apex: fruit acutely 4-angled, pyramidal; endocarp fibrous, resembling a putamen, separating from the epicarp.—*DC. prod.* 3. *p.* 288; *Spr. syst.* 3. *p.* 127; *Roxb. fl. Ind.* 2. *p.* 636; *Wall. L. n.* 3632; *Wight! cat. n.* 1082.—Butonica speciosa, *Lam. ill. t.* 590. *and* 591. *f.* 1.—Manmea asiatica, *Linn. sp. p.* 731. —*Rumph. Amb.* 3. *t.* 114.

1037. (2) B. *racemosa* (Roxb.:) leaves cuneate-oblong, acuminated, serrulated or crenulated: flowers (large) forming a long pendulous raceme: pedicels scarcely so long as the flower, 1-bracteated at the base: calyx 2–3-cleft: ovary 2-celled: ovules attached to the middle of the dissepiment: fruit ovate, bluntly 4-angled: endocarp scarcely separating from the epicarp.—*Roxb. fl. Ind.* 2. *p.* 634; *DC. prod.* 3. *p.* 288; *Spr. syst.* 3. *p.* 127; *Wall. L. n.* 3634.—Eugenia racemosa, *Linn. sp. p.* 673.—*Rheed. Mal.* 4. *t.* 6.

Our character of the ovary and fruit is taken from Roxburgh and Rheede: perhaps, however, future observations may prove both to be the same as in *B. speciosa*. *Careya macrostachya*, Jack (DC. prod. 3. p. 295), appears to us to belong to *Barringtonia*, and to be very nearly allied to the present species: its ovary is 4-celled.

1038. (3) B. *acutangula* (Gærtn.:) leaves cuneate-obovate, serrulated: racemes long, pendulous: pedicels very short: (flowers small): calyx 4-cleft: ovary 2-celled: ovules suspended from a placenta projecting from the dissepiment close to the apex of each cell: fruit oblong, 4-sided, sharp-angled: endocarp firmly attached to the epicarp.—*Gærtn. fr.* 2. *p.* 97. *t.* 101; *Roxb. fl. Ind.* 2. *p.* 635; *Wight! cat. n.* 1083.—Eugenia acutangula, *Linn. sp. p.* 673.—E. racemosa, *Roxb. in E. I. C. mus. tab.* 149.—Stravadium rubrum, *Pers.; DC. prod.* 3. *p.* 289; *Wall.! L. n.* 3635.—S. album, *Pers.?; DC.? l. c.*—S. coccineum, *DC. l. c.*—Meteorus coccineus, *Lour.; Spr. syst.* 3. *p.* 127.—*Rheed. Mal.* 4. *t.* 7; *Rumph. Amb.* 3. *t.* 116? (bad).

Digitized by Google

The figure of Rumphius just quoted belongs, we believe, to this species, although he describes the flowers as white: but be that as it may, the representation of the leaves is erroneous, and in opposition to his own description, which indicates that they are broadest at the apex, and therefore obovate, not acuminated as in the plate, and in the characters drawn up from it by Persoon and De Candolle: we cannot comprehend how these botanists can compare this figure with *B. racemosa*. Rumphius, Amb. 3. t. 115, is usually referred here, but of that we have considerable doubts.

X. CAREYA. *Roxb.*

Calyx-tube globose: limb 4-partite, persistent. Petals 4, ovate or oblong, obtuse, spreading, inserted into a hollow rim between the segments of the calyx and the crown of the ovary. Stamens very numerous, in several rows: filaments distinct above, united at the base into one thick fleshy ring, inserted into the same hollow rim with the petals, forming three circles; the exterior and interior of which are without anthers, the middle antheriferous. Ovary 4-celled, surmounted by an elevated ring: ovules numerous. Style filiform. Stigma capitate, obscurely 4-lobed or toothed. Berry covered by the calyx which forms the rind, crowned with its lobes. Seeds several, nestling in and scattered through the pulp of the fruit. Embryo large, almond-like, not separable into cotyledons and radicle, of two concentric homogeneous layers.—Arborescent or herbaceous. Leaves alternate, approximated towards the ends of the branches, short-petioled, cuneate-obovate, between crenulated and serrulated, without pellucid dots. Flowers large, red or greenish yellow, sessile and forming a short spike or head, or pedicellate and somewhat corymbose.

The calyx is rarely but occasionally 5-cleft, with as many petals.—This genus is so very much allied to the last, that, excepting the stigma, the two rows of abortive stamens, the very numerous ovules in each cell of the ovary, and the fruit with several seeds scattered through its pulp, we can point out no character to separate the two: hence we refer *C. macrostachya* of Jack to *Barringtonia*. We must, however, remark, that Roxburgh describes the seeds of both genera with a simple embryo the length of an ample albumen: Gærtner also describes and figures the same in *Barringtonia:* and Hamilton (in Linn. soc. trans. 15. p. 98) says of *Careya arborea*, "Albumen album, formæ seminis, carnosum: Embryo recta, teres utrinque acutiuscula, longitudine albuminis, centralis." On the other hand, Blume affirms that in *Barringtonia* there is no albumen: Gærtner, under *B. speciosa*, says that the albumen is "cum embryone arctissime conferruminatum." Roxburgh, describing *Car. sphærica*, remarks, "when vegetation commences the radicle issues from the small end of the seed, close to the umbilicus, and the scaly plumula from the opposite end; the embryo furnishing the centre or ligneous part, and the perisperm (or albumen) the cortical part of the young plant:" and under *Barr. racemosa*, "when vegetation begins, the plumula issues from the base of the fruit, and the simple embryo forms the ligneous centre of the shoots, while the perisperm (or albumen) furnishes the cortical part and the leaves." After comparing these observations, for we regret to say that we have it not in our power at present to decide the point by an actual examination of the ripe seed, we have no doubt but the structure in both genera is identical, and that the supposed albumen is part of the embryo, while no real albumen exists.

1039. (1) C. *arborea* (Roxb.:) arborescent: leaves obovate or oblong, slightly serrulate-toothed: flowers sessile in terminal short few-flowered spikes: fruit broadly ovate, crowned by the erect segments of the calyx.—*Roxb. Cor.* 3. *t.* 218; *fl. Ind.* 2. *p.* 638; *DC. prod.* 3. *p.* 295; *Spr. syst.* 3. *p.* 127; *Ham. in Linn. soc. trans.* 15. *p.* 97; *Wall.! L. n.* 3640; *Wight! cat. n.* 1084.—Cumbea Coneanæ, *Buch. Ham. Mysore*, 3. *p.* 187.—*Rheed. Mal.* 3. *t.* 36.

The petals in this and *C. sphærica* soon become revolute, in which state they appear as if acute.

Digitized by Google

ORDER LXV.—ONAGRARIÆ. *Juss.*

Calyx tubular, with the limb usually quadripartite, sometimes sexpartite, very rarely 3–2-partite, the lobes sometimes cohering in various degrees: æstivation valvular. Petals usually equal in number to the lobes of the calyx, regular (or rarely irregular), inserted at the top of the tube: æstivation twisted. Stamens definite: filaments distinct: anthers oblong or ovate: pollen triangular. Ovarium plurilocular, cohering with the tube of the calyx: ovules indefinite, rarely definite: style filiform: stigma capitate or lobed. Fruit baccate or capsular, dehiscent or indehiscent, 1–2–4-celled. Seeds indefinite, rarely definite, or solitary in each cell. Albumen none. Embryo straight: radicle long and slender, pointing to the hilum, cotyledons short, equal, or rarely unequal.—Leaves alternate or opposite, not dotted.

This order is sometimes divided into three:—1. *Onagrariæ*, properly so called, which have numerous ovules in each cell of the ovary; 2. *Circæaceæ*, with a solitary erect ovule; and, 3. *Hydrocaryes*, with a solitary pendulous ovule in each cell. As a combined order they are distinguished principally from *Haloragеæ* by the presence of a style, and much more developed limb to the calyx.

I. JUSSIÆA. *Linn.; Gærtn. fr.* 1. *t.* 31; *Lam. ill. t.* 280.

Calyx-tube prism-shaped or cylindrical, cohering with the ovary its whole length and not produced beyond it: limb divided down to the ovary into 4–6 persistent acute segments. Petals as many as the calycine lobes, spreading. Stamens twice as many as the petals, and deciduous with them. Ovary either flattish at the apex, or elevated into a furrowed cone. Style filiform, short. Stigma capitate, 4–6-furrowed. Capsule 4–6-celled, oblong, often ribbed, opening between the ribs, crowned by the lobes of the calyx. Seeds very numerous in each cell, naked.—Herbaceous or rarely slightly shrubby plants, growing in marshy situations. Leaves alternate, usually quite entire. Flowers axillary, solitary, sessile or shortly pedicellate, with often 2 bracteoles at the base, yellow or rarely white.

1040. (1) J. *repens* (Linn.:) herbaceous, glabrous, creeping or floating by means of vesicles round the insertion of the leaves, throwing out roots from the joints: leaves oblong-obovate, obtuse or retuse, petioled; flowers on longish pedicels, with two minute fleshy abortive bracteoles at the base of the ovary: tube of the calyx slightly villous, cylindrical, attenuated at the base; lobes 5, lanceolate, acute, twice as short as the 5 obovate emarginate petals. —*Linn. mant. p.* 381; *Ham. in Linn. soc. trans.* 14. *p.* 205; *DC. prod.* 3. *p.* 54; *Spr. syst.* 2. *p.* 332; *Roxb. fl. Ind.* 2. *p.* 401; *in E. I. C. mus. tab.* 644; *Wall.! L. n.* 6331; *Wight! in Hook. Bot. misc.* 3. *p.* 300. *suppl. t.* 40; *cat. n.* 1085.—J. fluviatilis, *Blume; DC. l. c.*—Cubospermum palustre, *Lour.*—*Rheed. Mal.* 2. *t.* 51.

The above character and synonyms relate solely to the East Indian form of the plant; but we have specimens from various parts of America and the West Indies, proving that sometimes this species is quite glabrous on the tube of the calyx, and sometimes pubescent all over: see Hook. and Arn. in Hook. Bot. misc. 3. p. 312.

Digitized by Google

1041. (2) J. *villosa* (Lam.:) herbaceous, perennial, erect, more or less pubescent or slightly villous: leaves from broadly lanceolate to linear-acuminated, tapering at the base into a short petiole: flowers almost sessile, with two bracteoles often foliaceous but sometimes minute and scale-like between the base and the middle of the calyx-tube: calyx-lobes 4 or sometimes 5, broadly lanceolate or ovate, 3–5-nerved, much shorter than the roundish obovate petals: capsule nearly cylindrical, elongated, tapering at the base into a shortish pedicel.—*α*; leaves lanceolate, acuminated, pubescent or hairy: capsule about the length of the leaves.—*Wight! cat. n.* 1086.—J. villosa, *Lam. enc. meth.* 3. *p.* 331; *DC. prod.* 3. *p.* 57; *Spr. syst.* 2. *p.* 231; *Wall.! L. n.* 6333.—J. suffruticosa, *Linn.; DC. prod. l. c. p.* 58; *Roxb. in E. I. C. mus. tab.* 645; *Wall.! L. n.* 6334.—J. fruticosa, *DC. l. c. p.* 57.—J. exaltata, *Roxb. fl. Ind.* 2. *p.* 401.—Epilobium fruticosum, *Lour.*—*Rheed. Mal.* 2. *t.* 50.—*β*; leaves linear-acuminated, slightly pubescent, about twice the length of the capsules.—*Wight! cat. n.* 1087.

Of our second variety we have only one specimen before us, which prevents our ascertaining whether or not it be sufficiently constant to constitute a distinct species: it is closely allied to *J. angustifolia*, Lam., and to *J. Blumeana*, DC.

II. LUDWIGIA. *Roxb.; DC.*

Calyx-tube cylindrical or rarely turbinate, cohering with the ovary its whole length: limb divided down to the ovary into 4 or occasionally 5 ultimately deciduous segments. Petals 4–5. Stamens 4–5, opposite to the lobes of the calyx. Apex of the ovary or base of the style pyramidal, 4–5-angled, 4–5-furrowed; furrows glabrous, opposite to the stamens; angles alternating, villous. Style filiform from the top of the pyramidal base. Stigma capitate, 4–5-furrowed or lobed. Capsule turbinate or much elongated, 4–5-celled, with as many valves, surmounted with the pyramidal base of the style. Seeds very numerous.—Branched herbaceous plants. Leaves alternate, narrow-lanceolate, shortly petioled, quite entire. Flowers axillary, almost sessile, yellow, with two bracteoles at the base of the calyx.

1042. (1) L. *parviflora* (Roxb.:) erect, annual, glabrous, branched: branches diffuse: leaves lanceolate; lower ones often, and the upper sometimes oblong: flowers shortly pedicellate: capsule obsoletely 4–5-angled, equally thick, in length about 2–3 times its breadth, much shorter than the leaves: seeds crowded in several rows in each cell, attached to a projecting placenta.—*Roxb. fl. Ind.* 1. *p.* 419; (*ed. Wall.*) 1. *p.* 440; *in E. I. C. mus. tab.* 1340; *DC. prod.* 3. *p.* 59; *Spr. syst.* 1. *p.* 445; *Wight! cat. n.* 1088.—L. jussiæoides, *herb. Madr.!; Wall.! L. n.* 6335 (not *Lam.*)—L. diffusa, *Ham. in Linn. soc. trans.* 14. *p.* 301; *Wall. L. n.* 6336.—L. perennis, *Linn. sp. p.* 173; *DC. l. c.*—L. oppositifolia, *Linn. syst. veg. p.* 135.—L. Zeylanica, *Pers.; Spr. syst.* 1. *p.* 444.—Jussiæa caryophyllæa, *Lam. enc. meth.* 3. *p.* 331.—*Rheed. Mal.* 2. *t.* 49; *Pluk. t.* 203. *f.* 5.

The description given by Linnæus in the Flora Zeylanica, n. 66, is sufficiently in accordance with some of our specimens; but the character *(foliis oppositis)* afterwards given in the Species Plantarum, and we think by a mistake of the printer, has been continued by most succeeding botanists. We have retained the specific name given by Roxburgh, because all the older ones have been accompanied by erroneous characters, except that of Lamarck, who, however, places it in *Jussiæa*. Some specimens before us have the leaves very narrow, corresponding to Linnæus' observations in the Flora Zeylanica; in others they are much broader, resembling Rheede's figure; while in a few they are oblong and obtuse, as in Plukenet: so many intermediate states, however, are to be observed, that we have found it impossible to separate them as distinct varieties.

Digitized by Google

III. TRAPA. *Linn.; Lam. ill. t.* 73; *Gærtn. fr.* 1. *t.* 26.

Calyx-tube cohering with the ovary: limb 4-partite. Petals 4. Stamens 4. Ovary 2-celled, surmounted by a more or less conspicuous cup-shaped crown or appendage: ovules solitary in each cell, pendulous. Stigma capitate. Fruit nut-like, indehiscent, hard and almost horny, turbinate, crowned with 2–4 horns (the hardened lobes of the calyx), 1-celled. Seed solitary, large, pendulous. Cotyledons very unequal; one very small, protruded through a perforation in the apex of the fruit during germination; the other very large, farinaceous, remaining within the fruit.—Herbaceous floating plants. Roots fibrous. Leaves; lowest ones opposite, the others alternate; lower ones divided into capillary segments; upper crowded, deltoid, toothed, with the petiole swollen in the middle, and rendering the plant buoyant while in flower. Flowers axillary. Seeds eatable.

1043. (1) T. *bispinosa* (Roxb.:) upper leaves and petioles tomentose beneath: peduncles shorter than the petioles: calyx villous: crown of the ovary 8-furrowed, the margins curled: fruit 2-horned; horns opposite, strong, straight, conical, very sharp, barbed backwards.—*Roxb. Cor.* 3. *t.* 234; *fl. Ind.* 1. *p.* 428; (*ed. Wall.*) 1. *p.* 449; *in E. I. C. mus. tab.* 1345; *DC. prod.* 3. *p.* 64; *Spr. syst.* 1. *p.* 446; *Wall. L. n.* 6339; *Wight! cat. n.* 1089.—T. quadrispinosa, *Wall.! L. n.* 6340. *b.* (not *Roxb.*)—*Rheed. Mal.* 11. *t.* 33.

ORDER LXVI.—HALORAGEÆ. *R. Brown.*

Subord. 1. CERCODEEÆ (*Rich.*) Calyx with the limb 3–4-partite or entire. Petals inserted at the top of the tube of the calyx and alternate with its segments, or wanting. Stamens inserted with the petals, twice as many, or equal to them in number, rarely fewer. Ovarium closely cohering with the tube of the calyx, 1–3–4-celled: ovules solitary, pendulous: styles wanting, or distinct and as many as the cells of the ovary: stigmas equal in number to the cells, pappulose or penicilliform. Fruit dry and indehiscent, membranous or bony, with as many cells as stigmas (or fewer from abortion). Seeds solitary, pendulous. Albumen fleshy, sometimes very thin. Embryo straight in the axis of the albumen: radicle superior, long, cotyledons minute.—Leaves alternate, opposite, or whorled. Flowers axillary, sessile, sometimes unisexual.

I. SERPICULA. *Linn.; Lam. ill. t.* 758.

Flowers monœcious.—MALE. Calyx small 4-partite. Petals 4. Stamens 4 or 8. Styles 4, sterile, in the centre of the flower.—FEM. Calyx-tube cohering with the ovary; limb minute, 4-partite. Petals and stamens wanting. Ovary 4-celled. Ovules 4. Styles 4, spreading, terminated each by a large pappulose stigma. Nut brittle, 1-celled, 1-seeded.—Herbaceous creeping branched plants. Leaves opposite or alternate, quite entire or toothed. Flowers axillary: male pedicellate: female aggregated, almost sessile.

Although we have described the ovary as 4-celled, we have done so only from analogy; from the minuteness of the flowers we have not been able to trace any of the

Digitized by Google

dissepiments, although the four pendulous ovules may easily be discovered: when the ovary is pretty far advanced into the state of fruit, three abortive and one fertile ovule may still be observed, but without any conspicuous dissepiments. Can the ovary be only 1-celled?

1044. (1) S. *brevipes* (W. & A.:) nearly quite glabrous: leaves opposite, cuneate-oval, toothed towards the apex: male flowers 8-androus, on glabrous pedicels about the length of the leaves.—*Wight! cat. n.* 1090.—Serpicula, *Wall.! L. n.* 7488.——Neelgherries.

Had Bory and De Candolle not placed *S. veronicæfolia* in the genus while described as having only four stamens, we should have had no hesitation in uniting our plant to it.—This genus must not be confounded with the other *Serpicula* in Wallich's List, n. 5048, although, probably from inadvertency, they have been considered the same by Dr Royle, and referred by him to the same natural order (Wall. L. p. 261).

1045. (2) S. *hirsuta* (W. & A.:) stems hirsute: leaves opposite cuneate-oblong or oval, toothed towards the apex, slightly hairy particularly on the under side: male flowers 8-androus, on hairy pedicels twice the length of the leaves.—*α*; leaves oval, slightly cuneate at the base.—*Wight! cat. n.* 1091. —*β*; leaves narrow-oblong, cuneate and tapering towards the base.—*Wight! cat. n.* 1092.——Neelgherries.

II. HALORAGIS. *Forst.*—Goniocarpus. *Thunb.*—Cercodia. *Murr.; Lam. ill. t.* 319.

Calyx-tube cohering with the ovary: limb 4-partite. Petals 4, alternate with the lobes of the calyx. Stamens 4–8. Stigmata 2–4, sessile and pappulose, or pencil-shaped at the extremity of short styles. Fruit nut-like, 2–4-celled and 2–4-seeded, or from abortion 1-celled and 1-seeded.—Herbaceous or shrubby plants. Leaves opposite or alternate, glabrous or scabrous, toothed or quite entire. Flowers usually nearly sessile in the axils of the upper leaves, rarely racemose, bisexual or rarely monœcious.

We can give almost no character except the habit to separate this genus from the last: with the exception, however, of *Goniocarpus tenellus* of De Candolle, it may be distinguished by the bisexual flowers; and even that species has pencil-shaped stigmas and sessile male flowers, very different from *Serpicula*.

1046. (1) H. *oligantha* (W. & A.:) herbaceous?, glabrous, procumbent: leaves alternate, narrow-linear, tapering at both ends, serrated towards the apex: flowers minute, axillary, solitary, sessile: calyx-tube marked with four projecting angles: petals linear-lanceolate, obtuse, much longer than the segments of the calyx: stamens 4: stigmas 4, large, sessile, pappulose: nut muricated, 1-celled, 1-seeded.—*Wight! cat. n.* 1093.——Neelgherries.

III. MYRIOPHYLLUM. *Vaill.; Linn.; Gærtn. fr.* 1. *t.* 68; *Lam. ill. t.* 775.

Flowers monœcious or bisexual, rarely dioecious.—MALE. Calyx 4-partite. Petals 4, alternate with the lobes of the calyx, caducous. Stamens 4, 6, or 8.—FEM. Calyx cohering with the ovary; limb 4-lobed. Petals 4, smaller than in the male, very caducous, often inconspicuous or wanting. Stamens when present without anthers. Ovary 4-celled. Styles wanting. Stigmas linear-oblong, compressed, pappulose on the inner surface. Fruit 4-lobed, consisting of 4 compressed or subglobose carpels cohering by their inner angles and inclosed in and closely attached to the slightly enlarged calyx-tube: each carpel nut-like, indehiscent, 1-seeded.—BISEX. Same as

Digitized by Google

in the female, but with perfect stamens.—Aquatic floating herbaceous plants, having their upper part emersed while flowering. Leaves usually opposite or verticillate. Flowers small, verticillate in the axils of the floral leaves: the upper usually male, the lower female, and the intermediate ones sometimes bisexual.

1047. (1) M. *Indicum* (Willd.:) leaves in fours, verticellate; lower ones divided in a pinnated manner into capillary lobes; upper gradually narrower and pinnatifid with the undivided portion broader; uppermost cuneate-lanceolate, toothed or almost quite entire: flowers verticellate, monœcious: stamens 8; anthers oblong: female flowers with 4 petals: carpels rugose and tubercled, cohering at the axis.—*Willd. sp.* 4. *p.* 407; *DC. prod.* 3. *p.* 68; *Spr. syst.* 3. *p.* 853; *Wall.! L. n.* 6338 (excl. *c*); *Wight! cat. n.* 1094.—— Coromandel. Neelgherries.

We have no doubt of our plant being the same as that sent from the Madras herbarium to Willdenow, although he states that Klein had observed the flowers to be bisexual: in the quotation, however, from Klein's description, we do not observe any thing to warrant that inference: in all our specimens the upper flowers are male.

1048. (2) M. *tetrandrum* (Roxb.:) leaves verticellate, lower ones divided in a pinnated manner into capillary segments; upper ones much the smaller, pinnatifid: flowers verticellate, monœcious: stamens 4: carpels nearly smooth and even, blunt on the back.—*Roxb. fl. Ind.* 1. *p.* 451; (*ed. Wall.*) 1. *p.* 470; *DC. prod.* 3. *p.* 69.

Subord. 2. CALLITRICHINEÆ (*Link.*) Calyx exceedingly minute, inconspicuous, surrounding the ovarium, soon rupturing. Petals wanting. Stamens 1, rarely 2: filament filiform, grooved in the inside: anther reniform, 1-celled, bursting transversely. Ovarium solitary, tetragonal, compressed, 2-celled (of two carpels, the dorsal sutures being slightly inflexed towards the axis): ovules in pairs, peltate: styles none: stigmas 2, filiform, pappulose on their inner surface. Fruit 2-celled, contracted at the dorsal sutures, at once loculicidal and septicidal (thus as if composed of four achenia, attached round the base of the stigmas by the centre of their inner angle). Seeds, 2 in each cell, divaricating (or in each achenium solitary), peltate. Embryo slightly curved in the axis of a thin fleshy albumen: radicle superior, long: cotyledons very short.—Aquatic herbaceous plants. Leaves opposite, simple, entire. Flowers axillary, very minute, usually unisexual, sometimes with two small bracteæ at the base of the short peduncle.

IV. CALLITRICHE. *Linn.; Lam. ill. t.* 5; *Gærtn. fr.* 1. *t.* 68.

Character the same as that of the suborder.

1049. (1) C. *Wightiana* (Wall.:) stems depressed, creeping: leaves all obovate, tapering at the base, obtuse, 3-nerved: flowers nearly sessile; the pedicels without bracteoles: fruit of 4 equal lobes, each with a winged keel at the back; pericarp membranous and cellular.—*Wall.! L.* under *n.* 7008; *Wight! cat. n.* 1095.—C. verna var. vulgaris, *Wall.! L. n.* 7008.——Neelgherries.

Digitized by Google

ORDER LXVII.—CUCURBITACEÆ. *Juss.*

Calyx 5-toothed, sometimes obsolete. Petals 5, distinct or more or less united, sometimes scarcely distinguishable from the calyx, strongly marked with reticulating veins, sometimes fringed. Stamens 5, distinct or triadelphous: anthers 2-celled (or rarely 1-celled?), usually long and sinuous, rarely ovate. Ovarium adhering to the tube of the calyx, of 3 carpels, often spuriously 1-celled: ovules solitary or indefinite: style short; stigmas 3, 2-lobed, very thick, velvety or fringed. Fruit fleshy, usually a peponida *. Seeds usually ovate and compressed, enveloped in a juicy, or dry and membranous, arillus: testa coriaceous, often thick at the margin. Albumen none. Embryo straight: radicle next the hilum: cotyledons foliaceous, palmatinerved.—Stem succulent, climbing by means of tendrils usually lateral and formed of abortive stipules. Leaves palmatinerved, alternate. Flowers usually unisexual.

TRIBE I.—NHANDIROBEÆ. *St. Hil.*

Tendrils axillary, formed probably of abortive peduncles. Flowers dicœcious.

I?. ZANONIA. *Linn.; Lam. ill. t.* 816.

Flowers dicœcious.—MALE. Calyx 3-lobed. Petals 5, patent, united into a 5-partite rotate corolla. Stamens 5; filaments flat, connate at their base: anthers adnate, 1-celled (*DC.*)—FEM. Calyx-tube cohering with the ovary: limb 5-lobed. Corolla as in the male. Ovary 3-celled. Styles 3, patent, bifid at the apex. Fruit fleshy, marked round the apex by a circular line, 3-celled, opening at the top by 3 valves: placenta central, fleshy, large, 3-angled. Seeds ovate, with a large foliaceous border. Embryo without albumen, inverted.—Climbing glabrous plants. Leaves alternate, petioled, without stipules, ovate-elliptical or ovate-lanceolate, rounded or cordate at the base, quite entire. Tendrils axillary. Peduncles axillary, racemose.

A remarkable genus, but scarcely yet understood as to the structure of the flower and fruit. De Candolle states the anther to be 1-celled; but he does not appear to have seen specimens, and the generic character given by him does not even apply to both his species. We have not seen specimens of any of the species.

1050. (1) Z. *Indica* (Linn.:) leaves elliptical, acute, slightly cordate at the base: racemes axillary: ovary clavate, with 2 ovules in each cell: fruit oblong, elongated, tapering from the apex to the base, slightly 3-angled.—*DC. prod.* 3. *p.* 298; *Spr. syst.* 1. *p.* 932; *Lam. ill. t.* 816.—*Rheed. Mal.* 8. *t.* 47, 48.

* A *pepo* or *peponida* is a fleshy inferior fruit, either indehiscent or bursting irregularly, and consisting of about three carpels, each of which is divided into two cells by its placentiferous margin being so introflexed as to reach the dorsal suture. The sides of the carpel, and even sometimes the introflexed portion, usually become extremely thick and fleshy, forming the great mass of the ripe fruit, so that by losing the general character of dissepiments, they might almost be said to disappear; and thus at first sight a pepo would be said to be, and has been so described, a 1-celled, fleshy, indehiscent fruit, with parietal placentas that send out sometimes false dissepiments towards the axis, as the cucumber and gourd.

Digitized by Google

TRIBE II.—CUCURBITEÆ *. *DC.*

Tendrils lateral, formed of abortive stipules. Flowers bisexual, diœcious, or monœcious. Fruit a peponida or berry.

II. LAGENARIA. *Seringe.*

Flowers monœcious. Calyx campanulate: segments subulate or broadish, shorter than the tube. Corolla (white): petals obovate, springing from within the margin of the calyx.—MALE. Stamens 5, triadelphous: anthers very flexuose.—FEM. Style scarcely any. Stigmas 3, thick, 2-lobed, granular. Peponida fleshy, indehiscent. Seeds numerous, obovate, compressed, with a tumid border 2-lobed at the apex.

1051. (1) L. *vulgaris* (Ser.:) softly pubescent; stem climbing: tendrils 3–4-cleft: leaves cordate, nearly entire or lobed, the lobes obtuse or acute, somewhat glaucous, with 2 glands at the base: flowers fascicled: petals very patent: connectivum of the anthers covered with oblong acute papillæ: fruit pubescent, at length nearly glabrous and very smooth.—*Ser. in DC. prod.* 3. *p.* 299; *Wight! cat. n.* 1098.—Cucurbita Lagenaria, *Linn. sp. p.* 1434; *Lam. ill. t.* 795. *f.* 2; *Spr. syst.* 3. *p.* 45; *Roxb. fl. Ind.* 3. *p.* 718; *Wall. L. n.* 6719.—*Moris. hist.* 1. *t.* 5. *f.* 1–3; *Rheed. Mal.* 8. *t.* 1, 4, 5; *Rumph. Amb.* 5. *t.* 144.

III. CUCUMIS. *Linn.; Gærtn. fr.* 1. *t.* 88; *Lam. ill. t.* 795.

Flowers monœcious or bisexual. Calyx tubular-campanulate. Segments subulate, scarcely the length of the tube. Petals (yellow) scarcely united together and with the calyx.—MALE. Stamens 5, triadelphous.—FEM. Stigmas 3 (or occasionally 4), thick, bipartite. Peponida fleshy, indehiscent or (rarely) bursting irregularly. Seeds ovate, compressed, not margined, acute at the hilum.—Flowers axillary, peduncled, solitary or several together.

Besides the following, Dr Wallich notices in his List (n. 6727) a species from the Missionary Garden named doubtfully *C. chæta*, which we have not seen.

1052. (1) C. *Melo* (Linn.:) stems prostrate, scabrous: leaves rounded, angled: male flowers with the calyx-tube slightly ventricose at the base and dilated at the apex: stamens included; anthers shorter than the connectivum: bisexual flowers with the anthers as in the male: stigmas 3–4, shortly 2-lobed: fruit ovate or somewhat globose, 8–12-furrowed.—*DC. prod.* 3. *p.* 300; *Spr. syst.* 3. *p.* 46; *Roxb. fl. Ind.* 3. *p.* 720; *Wall. L. n.* 6738; *Wight! cat. n.* 1099.—*Moris. hist.* 1. *t.* 6. *f.* 4.

1053. (2) C. *Momordica* (Roxb.:) stem scabrous: leaves roundish-cordate, sometimes 5-angled or obscurely lobed, repand-toothed: flowers short-peduncled, males fascicled, female solitary: petals slightly acute: fruit cylindric-oblong, straight, 4 times longer than thick, bursting spontaneously, (12–24 inches long).—*Roxb. fl. Ind.* 3. *p.* 720; *Wight! cat. n.* 1100.—C. muricatus, *Willd.? sp.* 4. *p.* 613; *DC.? prod.* 3. *p.* 301; *Spr.? syst.* 3. *p.* 46; *Wall.? L. n.* 6735.—Momordica sativa, *Roxb. in E. I. C. mus. tab.* 456.

We have not at present before us the ripe fruit, our description of it being taken from Roxburgh: our only doubt of this being also *C. muricatus*, Willd., arises from Roxburgh not mentioning the asperities from which Willdenow derives the name.

* Every one who has studied this group must be aware of the almost insurmountable difficulties attendant on the description of the species from dried specimens. Although our own materials on the whole be tolerably complete, yet with the additional assistance of drawings, we frequently could not determine whether Seringe's alterations on the Linnæan distribution of the species ought to be received or rejected: we have considered it, however, more prudent to follow Roxburgh as closely as possible, as his opportunities of examining both seeds and stamens must have been most ample.

Digitized by Google

1054. (3) C. *sativus* (Linn.:) stem scabrous: leaves cordate, 5-lobed, the terminal lobe the longest: flowers shortly peduncled, about 3 together (largish); males with the calyx-tube tubular-campanulate, and the limb patent and deflexed: petals a little acute: fruit linear-oblong, straight, somewhat triquetrous, at first tubercled, when ripe smoothish and often shining, indehiscent.—*DC. prod.* 3. *p.* 300; *Spr. syst.* 3. *p.* 46; *Lam. ill. t.* 795; *Roxb. fl. Ind.* 3. *p.* 720; *Wall. L. n.* 6737; *Wight! cat. n.* 1101.—*Moris. hist.* 1. *t.* 6. *f.* 6; *Rheed. Mal.* 8. *t.* 6.

*1055. (4) C. *flexuosus* (Linn.:) stem scabrous, flexuose: leaves cordate-ovate, somewhat lobed, slightly toothed: flowers fascicled: calyx very hairy: fruit clongated, cylindric and slightly clavate, furrowed, flexuose.—*DC. prod.* 3. *p.* 300; *Spr. syst.* 3. *p.* 46.—*Moris. hist.* 1. *t.* 6. *f.* 7.

1056. (5) C. *utilissimus* (Roxb.:) stems scabrous: leaves broad-cordate, more or less 5-lobed, lobes rounded and toothed: male flowers crowded, female solitary: fruit short oval, when young pubescent, when old glabrous, variegated, (4–6 inches long and 3–4 thick).—*Roxb. fl. Ind.* 3. *p.* 721; *in E. I. C. mus. tab.* 462; *Wall. L. n.* 6731.

1057. (6) C. *pubescens* (Willd.:) stems scabrous: leaves somewhat reniform, repandly and acutely toothed, slightly angled, the angles obtuse or acute, petals slightly acute: fruit oval, obtuse at both ends, terete, spotted, more or less pubescent, (about 1 or 1½ inch long).—*Willd. sp.* 4. *p.* 614; *DC. prod.* 3. *p.* 301; *Spr. syst.* 3. *p.* 46; *Wight! cat. n.* 1102.—C. maderaspatanus, *Roxb. fl. Ind.* 3. *p.* 723; *in E. I. C. mus. tab.* 465; *Wall.! L. n.* 6734 (partly).

We have not seen the Linnæan specimen of *C. maderaspatanus*, but from the description given, and figure of Plukenet quoted, it is *Bryonia scabrella*. We are rather uncertain about *C. pubescens*, Wall.! L. n. 6729, as the unripe fruit is clavate and on a longish peduncle: perhaps it belongs to *C. trigonus* β.

1058. (7) C. *maculatus* (Willd.:) stems scabrous: leaves roundish reniform, obsoletely lobed, toothed: petals slightly acute: connectivum much produced beyond the anthers: fruit pyriform, terete, spotted, glabrous, (about 2½ inches long).—*Willd. sp.* 4. *p.* 614; *Ser. mem. sur les Cucurb. t.* 3; *DC. prod.* 3. *p.* 301; *Spr. syst.* 3. *p.* 46.

1059. (8) C. *turbinatus* (Roxb.:) stems scabrous: leaves palmately lobed; lobes obovate, repandly and sharply toothed; sinus obtuse: female flowers solitary; fruit pyriform, obsoletely 3-sided and bluntly 3-angled, variegated, glabrous, (scarcely 2 inches long).—*Roxb. fl. Ind.* 3. *p.* 723.—C. pyriformis, *Roxb. in E. I. C. mus. tab.* 464.

1060. (9) C. *trigonus* (Roxb.:) stems scabrous: leaves 5-lobed; lobes rounded, repandly and sharply toothed; male flowers crowded; female solitary: fruit oval, rounded at both ends, obsoletely 3-angled, 10-striated, glabrous, (about 1½ inch long and 1¼ thick).—α; lobes of the leaves very broadly obovate, and almost touching each other at their broadest part, sinus rounded.—*Wight! cat. n.* 1103.—C. trigonus, *Roxb. fl. Ind.* 3. *p.* 722; *in E. I. C. mus. tab,* 463.—β; lobes quite distinct, sinus widening upwards.—*Wight! cat. n.* 1104.—C. maderaspatanus, *Wall.! L. n.* 6734 (partly).

*1061. (10) C. *prophetarum* (Linn.:) leaves cordate, 5-lobed, toothed, lobes obtuse: flowers 2–5 together; males with a campanulate calyx and obovate petals; females with the tube of the calyx globose, 12-striated, hispid, the limb campanulate and crowned with the teeth: fruit globose, prickly, variegated, (the size of a cherry).—*DC. prod.* 3. *p.* 301; *Spr. syst.* 3. *p.* 47; *Wall.? L. n.* 6733.

1062. (11) C. *Colocynthis* (Linn.:) stems scabrous: leaves glabrous and nearly quite smooth above, copiously muricated beneath with small white and often hair-bearing tubercles, many-cleft and lobed, the lobes obtuse: tendrils

Digitized by Google

short and simple: female flowers solitary: calyx-tube globose and hispid; segments of the limb narrow-linear: fruit globose, glabrous; flesh very bitter.—*DC. prod.* 3. *p.* 302; *Spr. syst.* 3. *p.* 47; *Roxb. fl. Ind.* 3. *p.* 719; *Wall. L. n.* 6732; *Wight! cat. n.* 1105.—*Moris. hist.* 1. *t.* 6. *f.* 1.

1063. (12) C. *missionis* (Wall.)—*Wall. L. n.* 6728.——Tranquebar.

IV. LUFFA. *Tourn.; Cav.*

Flowers monœcious or rarely dicœcious. Calyx 5-toothed; tube in the male campanulate, in the female oblong-clavate. Petals 5, distinct, somewhat deciduous.—MALE. Stamens 5, distinct, 2–3-adelphous.—FEM. Stamens more or less abortive. Style 3-cleft. Stigmas reniform or bipartite. Peponida becoming at length dry and inwardly fibrous, usually opening by the fall or decay of a lid or stopple at the apex, sometimes indehiscent. Seeds usually (always?) with elevated or depressed dots.—Male flowers racemose: female solitary.

1064. (1) L. *pentandra* (Roxb.:) lower leaves acutely angled, upper ones palmate with lanceolate segments: male racemes (large) on a long peduncle; stamens distinct: calyx-segments of the female flowers covered with glands: fruit linear-oblong, smooth, marked with 10 longitudinal lines but not ribbed, (1–3 feet long and about 3 inches thick): seeds (gray) with elevated dots and sharp waved margins.—*Roxb. hort. Bengh. p.* 70; *fl. Ind.* 3. *p.* 712; *Wall. L. n.* 6751.—L. Cattupicinna, *Ser. in DC. prod.* 3. *p.* 303.—L. Petola, *Ser. l. c.* (char. bad).—Cucumis pentandrus, *Roxb. in E. I. C. mus. tab.* 459.—*Rheed. Mal.* 8. *t.* 8; *Rumph. Amb.* 5. *t.* 147.

1065. (2) L. *acutangula* (Roxb.:) stems glabrous: leaves 5-angled or 5-lobed, a little scabrous or nearly glabrous: male racemes long peduncled; stamens distinct: calyx-segments of the female flowers covered with glands: fruit (about a foot long and 2–3 inches thick) clavate, obtuse, or shortly pointed, pretty smooth, 10-angled, the angles sharp and smooth; lid inconspicuous, not separating spontaneously: seeds (black), irregularly pitted, 2-lobed at the base.—*Roxb. hort. Bengh. p.* 70; *fl. Ind.* 3. *p.* 713; *DC. prod.* 3. *p.* 302; *Wall. L. n.* 6759; *Wight! cat. n.* 1106.—Cucumis acutangulus, *Linn.; Spr. syst.* 3. *p.* 46; *Roxb. in E. I. C. mus. tab.* 458; *Wall.! L. n.* 6736.—*Rheed. Mal.* 8. *t.* 7; *Rumph. Amb.* 5. *t.* 149.

Roxburgh, in his drawing of this species, represents only three stamens, but all our specimens agree with Seringe's description that there are five and distinct. Roxburgh describes the fruit obtuse, but he quotes the above figure of Rheede, where it is shortly pointed.

1066. (3) L. *amara* (Roxb.:) stems slender: leaves a little scabrous, roundish-cordate, slightly 5–7-lobed: male racemes long-peduncled; stamens adelphous: fruit (3–4 inches long and 1 thick) oblong, tapering towards each end; acutely 10-angled; lid deciduous: seeds (blackish-gray) marked with elevated minute black dots; margin tumid, 2-lobed at the base. *Roxb. hort. Bengh. p.* 70; *fl. Ind.* 3. *p.* 715; *Wall. L. n.* 6754. *a*?; *Wight! cat. n.* 1107.—L. Plukenetiana, *Ser. in DC. prod.* 3. *p.* 302.—Cucumis operculatus, *Roxb. in E. I. C. mus. tab.* 460.—*Pluk. t.* 172. *f.* 1.

In our specimens the stems are slightly scabrous: Roxburgh says they are as in *L. acutangula.*

1067. (4) L. *echinata* (Roxb.:) stems very slightly hairy: leaves somewhat hairy, particularly on the nerves and veins underneath, about 5-lobed, repand-toothed: tendrils bifid: flowers small, dicœcious; male racemes longer than the leaves; stamens triadelphous: fruit oval, echinate with long straight rather soft diverging bristles: lid deciduous.—*Roxb. fl. Ind.* 3. *p.* 716; *in E. I. C. mus. tab.* 1694.

Digitized by Google

1068. (5) L. *tuberosa* (Roxb.:) root tuberous, perennial: stems glabrous, slender: leaves reniform-cordate, 5–7-angled or lobed, toothed, quite glabrous: tendrils simple: flowers small, white; male racemes few-flowered, very short: stamens diadelphous (3 and 2): female flowers solitary, long-peduncled: fruit (1½ inch long and half an inch thick) oblong, tapering at each end, smooth, with 8 sharp ridges, indehiscent.—*Roxb. fl. Ind.* 3. *p.* 717; *Wight! cat. n.* 1108.—L. amara, *Wall.! L. n.* 6754. *b.*—Cucumis tuberosus, *Roxb. in E. I. C. mus. tab.* 461; *Ainsl. mat. med. Hind. p.* 236.——Circars, *Roxburgh, Heyne.* Mysore, *Heyne.*—Tutacoryn, *Klein.*

† 1069. (6) L. *Kleinii* (W. & A.:) stems sulcated, glabrous: leaves on long petioles, cordate, 3–5-angled or slightly lobed, scarcely scabrous, sharply toothed; middle lobe the longest, triangular-acuminated: tendrils long, bifid: male racemes long-peduncled; female on a short peduncle: stamens and anthers distinct: fruit (very immature) oval, tomentose.—*Wight! cat. n.* 1139. —Cucurbita umbellata, *Klein.*; *Willd. sp.* 4. *p.* 608; *DC. prod.* 3. *p.* 318; *Spr. syst.* 3. *p.* 45; *Wall.! L. n.* 6724.——Mirittupadu; Travancore, *Klein.*

We have no doubt about the genus, but from the great imperfection of all the specimens yet known, it is impossible to characterise the species perfectly.

V. BENINCASA. *Savi.*

Flowers polygamous, monœcious, or occasionally bisexual. Calyx-segments short, broad, waved and toothed on the margin. Corolla 5-partite; segments roundish-obovate, spreading, waved and curled.—MALE. Stamens triadelphous, divaricating. Filaments short, broad. Anthers very irregular. —FEM. Stamens usually abortive. Stigma very thick, irregular. Pepo fleshy, covered externally with numerous brittle hairs. Seeds thickish on the margin.—Every where very hairy, with a musky smell. Leaves cordate, somewhat 5-lobed, the lobes acutish and crenated. Tendrils simple. Fruit from ovate to cylindrical, short or elongated, glaucous and covered with hairs.

1070. (1) B. *cerifera* (Savi.)—*Ser. mem. sur les Cucurb. t.* 4; *DC. prod.* 3. *p.* 303; *Wight! cat. n.* 1109.—Cucurbita cerifera, *Fisch.*—C. hispida, *Willd.? sp.* 4. *p.* 608; *Spr.? syst.* 3. *p.* 46; *Wight! in Wall.! L. n.* 6723.—C. Pepo, *Roxb. fl. Ind.* 3. *p.* 718.—C. alba, *Roxb. in E. I. C. mus. tab.* 457.—*Rheed. Mal.* 8. *t.* 3.

Our specimens were obtained from a plant that came up accidentally among some rubbish at Samulcottah.

VI. BRYONIA. *Linn.*; *Gært. fr. t.* 88.

Flowers unisexual. Calyx 5-toothed, as long as the undivided part of the corolla. Corolla 5-partite or 5-petalled, or not exceeding the calyx.—MALE. Stamens triadelphous. Anthers flexuose or nearly straight.—FEM. Calyx exceedingly constricted between the limb and the tube. Style 3-fid. Fruit berry, ovate, or oval or globose, generally few-seeded.

Although the berry of this genus be no doubt a modification of a peponida, it does not present the regular structure of that kind of fruit.

1071. (1) B. *Garcini* (Willd.:) stem glabrous: tendrils simple: leaves deeply 3–5-lobed, bristle-toothed, more or less scabrous: bracteas axillary, large, reniform, ciliated: berries small, inverse-reniform, 2-seeded: seeds oblong, thickest at the margin.—*Willd. sp.* 4. *p.* 623; *DC. prod.* 3 *p.* 308; *Spr. syst.* 3. *p.* 17; *Roxb. fl. Ind.* 3. *p.* 727; *Wall.! L. n.* 6712; *Wight! cat. n.* 1110. —B. reniformis, *Roxb. in E. I. C. mus. tab.* 468.—Sicyos Garcini, *Linn. mant. p.* 297; *Burm. Ind. t.* 57. *f.* 3.

Digitized by Google

1072. (2) B. *laciniosa* (Linn.:) stems glabrous: tendrils bifid: leaves slightly scabrous, palmately 5-lobed; segments oblong-lanceolate, acuminated, serrated: petioles shorter than the leaves, muricated: male flowers fascicled; female solitary in the same axil: berries (size of a cherry) spherical, glabrous, 3-celled: seeds few in each cell, with a pulpy arillus, tuberose margins, and gibbous suberose sides.—*Linn. sp. p.* 624; *DC. prod.* 3. *p.* 308; *Spr. syst.* 3. *p.* 17; *Roxb. fl. Ind.* 3. *p.* 728; *Wall.! L. n.* 6699; *Wight! cat. n.* 1111.

1073. (3) B. *leiosperma* (W. & A.:) stems, petioles and peduncles hispid and scabrous: tendrils simple: leaves cordate, 5-angled, or slightly 5-lobed, middle segment triangular, repand-toothed; upper side callous-scabrous, under densely hairy: flowers short peduncled, both kinds fascicled, the female in different axils from the male: berry globose, (size of a large pea), glabrous: seeds several, surrounded by a broad tumid zone, smooth.—*Wight! cat. n.* 1112.—B. scabrella, *Wall.! L. n.* 6708. *i.*——Dindygul hills.

Of this we have two states before us; the one with leaves softly hairy or almost tomentose on the under side; the other has them very harshly hirsute. It is with great reluctance that we separate this from the following: the habit is quite the same, and we know of no difference except in the seed.

1074. (4) B. *scabrella* (Linn.:) stems, petioles and peduncles hispid and scabrous: tendrils simple: leaves cordate, lobed or angled, scabrous on the upper side, scabrous and hispid on the under: flowers short-peduncled; males fascicled; female 1–4, in different axils from the male: berry globular, (size of a pea), glabrous or sprinkled with a few bristly hairs: seeds several, surrounded by a narrow zone, rugose from numerous shallow hollows.—*α, Plukenetii;* leaves acutely 5-lobed, the middle lobe often longer than the others; berries usually 2–4-together.—*Wight! cat. n.* 1113.—B. scabrella, *Linn. suppl. p.* 424; *DC. prod.* 3. *p.* 306; *Spr. syst.* 3. *p.* 16; *Wall.! L. n.* 6708 (partly).—B. Maderaspatana, *Berg.; DC. l. c.*—Cucumis Maderaspatanus, *Linn.; Spr. l. c. p.* 46.—*Pluk. t.* 170. *f.* 2 (good).—*β, Rheedei;* leaves larger, acutely 5-angled; berries usually 2–4 together.—*Wight! cat. n.* 1114.—B. scabrella, *Roxb. fl. Ind.* 3. *p.* 424; *in E. I. C. mus. tab.* 466; *Wall.! L. n.* 6708 (partly).—B. althæoides, *Ser. in DC. prod. l. c.*—*Rheed. Mal.* 8. *t.* 13.—*γ, Rottleri;* leaves small, scarcely angled; berries solitary.—*Wight! cat. n.* 1115.—B. scabra, *Rottl.!*—B. Rottleri, *Spr. l. c. p.* 15.—B. scabrella, *Wall.! L. n.* 6708. *f.*

1075. (5) B. *Maysorensis* (herb. Madr.!) stems glabrous, smooth: tendrils simple: leaves cordate, repand-toothed, usually 5-angled or lobed; slightly scabrous: male flowers in a simple or proliferous umbel at the apex of a long slender peduncle; female very shortly peduncled, solitary, often in the same axils with the males, rarely several umbellate at the apex of a long peduncle: calyx-tube and ovary narrow-oval: berry longish-oval, glabrous, copiously marked before maturity with small shallow pits: seeds smooth, surrounded with a zone, quite flat on the sides.—*Wall.! L. n.* 6702; *Wight! cat. n.* 1116.

1076. (6) B. *Hookeriana* (W. & A.:) stems glabrous and smooth: tendrils simple: leaves cordate, sharply repand-toothed, acutely angled or lobed, the middle lobe acuminated; upper side scabrous, under slightly hairy along the nerves and veins: male flowers in a simple or proliferous umbel at the extremity of a longish peduncle; females often several in an umbel at the apex of a long peduncle, in a different axil from the males, and also solitary on a simple short peduncle in the same axils with the (male or female) umbellate flowers: calyx-tube and ovary globose: berry globose, glabrous: seeds flat.—*Wight! cat. n.* 1117.

1077. (7) B. *umbellata* (herb. Madr.:) dicœcious: root perennial, consisting of several tubers: stems glabrous: tendrils simple: leaves on very short petioles, cordate, or sagittate, or hirsute at the base (the lobes longer than the

Digitized by Google

petiole), from oblong and entire, or roundish and angled, to more or less deeply 3–5-lobed or sometimes palmately 5-partite, sinuate and sharply toothed, scabrous on the upper side, smoothish and somewhat glabrous on the under, somewhat coriaceous: male flowers umbelled or shortly racemose at the apex of a longish slender peduncle; pedicels with a small narrow-oblong bracteole about their middle: calyx campanulate: females on a different plant, solitary, short peduncled: berry (about the size of a pigeon's egg) oblong, slightly angled, many-seeded: seeds (size of a small cherry-stone) orbicular, a little compressed, surrounded with an inconspicuously warted zone; sides convex, smooth.—*Willd. sp.* 4. *p.* 618; *DC. prod.* 3. *p.* 305; *Spr. syst.* 3. *p.* 16; *Roxb. in E. I. C. mus. tab.* 470; *Wall.! L. n.* 6705 (partly); *Wight! cat. n.* 1122.—B. sinuosa, *Wall.! L. n.* 6716.—B. Rheedei, *Blume; DC. l. c.* Momordica umbellata, *Roxb. fl. Ind.* 3. *p.* 710.—*Rheed. Mal.* 8. *t.* 26.

The shape of the leaves in this plant is so variable as well to merit the appellation given to it by Dr Wallich, "species vere pantomorpha." It is useless to separate it into varieties, as scarcely two leaves, even on the same specimen, are alike. Rheede's figure represents the most simple kind, but we have others before us cleft nearly to the base into long narrow linear-oblong segments. The appearance of the fruit is variable: its regular shape is perfectly oval, but by the abortion of seeds in the upper part we have seen it ovate as in Rheede's figure; or, by their abortion in the lower half, obovate: we have never observed a decided beak.—We scarcely know why Roxburgh placed it in *Momordica*: the fruit does not appear to burst open when ripe, nor are the seeds covered with the fleshy and juicy arillus of that genus: in habit it is often so like *B. amplexicaulis* that the flowers and fruit are requisite to enable one to discriminate them.

1078. (8) B. *amplexicaulis* (Lam.:) monœcious: stems glabrous: tendrils simple: leaves on very short petioles, or almost sessile, deeply cordate or sagittate at the base (the lobes much longer than the petiole), ovate or oblong, entire or angled, mucronate, sinuate and toothed, callous-dotted and slightly scabrous on the upper side, glabrous and smooth on the under, somewhat coriaceous: male flowers in an umbel at the apex of a slender peduncle rather shorter than the leaves; pedicels short, without bracteoles; calyx campanulate: females solitary, very short-peduncled, in the same or different axils from the males: berry (smaller than a hazel-nut) broadly ovate, rostrate, few- (about 4-) seeded: seeds oval, thick, compressed, surrounded with a thick corky closely warted and rugose zone, the sides flattish, sprinkled with little tubercles.—*Lam. encycl. meth.* 1. *p.* 496 (descr. good); *DC. prod.* 3. *p.* 306; *Wight! cat. n.* 1121.—B. umbellata, *Wall.! L. n.* 6705. *k, l* (and perhaps some others).——Southern Provinces.

1079. (9) B. *epigæa* (Rottl.:) stem glabrous, often very flexuose at the joints: tendrils simple: leaves somewhat fleshy, on longish petioles, cordate, sometimes only obtusely angled, usually 3-lobed, densely covered on both sides with short bristly hairs; lobes rounded, the lateral ones the broadest and slightly 2-lobed, all remotely and slightly toothed: male flowers shortly racemose at the apex of a long thickish peduncle; calyx campanulate: females shortish-peduncled, solitary, in the same or different axils from the males: berry ovate, rostrate, glabrous, few-seeded: seeds (white) compressed, with the sides slightly convex.—*Willd. sp.* 4. *p.* 619 (descr. good); *Spr. syst.* 3. *p.* 16; *Wall.! L. n.* 6709; *Wight! cat. n.* 1120—B. glabra, *Roxb. fl. Ind.* 3. *p.* 725; *in E. I. C. mus. tab.* 467.—B. palmata, *Wall.! L. n.* 6711. *d.*

The description of *B. epigæa* in De Candolle's prodromus, taken from Blume, can by no means be identified with our plant.

1080. (10) B. *rostrata* (Rottl.!) stems slender, hairy, or pubescent: tendrils simple: leaves on longish petioles, roundish-cordate, sinuate, toothed, pubescent: male flowers usually two together, pedicelled, on a slender pe-

Digitized by Google

duncle longer than the petiole; calyx campanulate: female solitary, very shortly peduncled, in the same axils with the male: berry ovate, rostrate, longitudinally striated, hairy, 2–6-seeded: seeds (black) compressed, with a thin margin; sides gibbous.—*Willd. sp.* 4. *p.* 616; *DC. prod.* 3. *p.* 304; *Spr. syst.* 3. *p.* 15; *Wall.! L. n.* 6701; *Wight! cat. n.* 1119.—B. pilosa, *Roxb. fl. Ind.* 3. *p.* 726; *in E. I. C. mus. tab.* 469.

* 1081. (11) B. *tubiflora* (W. & A.:) stems slender, slightly scabrous: tendrils simple: leaves longish petioled, cordate, 5-lobed, the middle lobe the longest and lanceolate, the others ovate, all sinuate and toothed, scabrous and hispid with short hairs on both sides: male flowers in a short corymbose raceme at the apex of a longish peduncle; pedicels persistent; calyx elongated, tubular; anthers all united together (syngenesious): females axillary, solitary, short-peduncled: fruit ovate, rostrate, sprinkled with a few short hairs: seeds several, irregularly reticulated with shallow hollows, cylindrical, truncated at the one end, suddenly compressed at the other.—*Wight! cat. n.* 1118.

Our specimens were obtained from Klein's herbarium, and marked as found at Trincomalee in Ceylon in February 1796. We do not know that it has been found on the Peninsula. Specimens of it were sent to Dr Wallich, without a name, so that it may be his *B. ? Wightiana*, Wall. L. n. 6703.

† 1082. (12) B. *callosa* (herb. Madr.)—*Wall. L. n.* 6710.—B. punctata, *Spr. syst.* 3. *p.* 15 (partly).

† 1083. (13) B. *cheirophylla* (Wall.)—*Wall. L. n.* 6715.

VII. COCCINIA. *W. & A.*

Flowers dicœcious. Calyx 5-cleft; segments subulate. Corolla much larger than the calyx, campanulate, 5-cleft; segments ovate, acuminated. MALE. Calyx very short. Stamens all united at the base into one slender column. Anthers distinct and connivent, very anfractuose.—FEM. Calyx-tube oblong, attenuated at the apex under the limb. Stamens abortive, triadelphous. Style short, 3-cleft: stigmas bifid. Pepo somewhat baccate, oblong, smooth, 3-celled, when ripe bursting irregularly. Seeds numerous, ovate, compressed, covered with a gelatinous arillus.—Shrubby, climbing, glabrous. Tendrils simple. Leaves on longish (about an inch long) petioles, cordate, from roundish and entire to 5-angled or more or less 5-lobed, minutely toothed, glabrous, nearly quite smooth, minutely dotted on the upper side, furnished on the under near the base with several concave glands. Peduncles in both male and female plants solitary, axillary, 1-flowered, bracteolate. Corolla white, pretty large. Fruit before maturity marked with ten white streaks, when ripe bright red.

This genus is allied to *Cucurbita* in its campanulate and 5-cleft corolla; to *Sechium* in the monadelphous stamens; to *Momordica* in its seeds and tendency of the fruit to split; and to *Bryonia* in the highly coloured fruit and its slightly baccate nature. From both *Momordica* and *Bryonia* it is easily recognised by the corolla, the staminal column, and several other characters.

1084. (1) C. *Indica* (W. & A.)—*α*; leaves entire or 5-angled, or slightly 5-lobed.—*Wight! cat. n.* 1123.—Bryonia grandis, *Linn. mant. p.* 126; *DC. prod.* 3. *p.* 305 (char. bad); *Spr. syst.* 3. *p.* 15; *Wall.! L. n.* 6700.—B. moi-moi, *Ser. in DC. l. c.*—Bryonia n. 356. *Linn. fl. Zeyl.*—Momordica monadelpha, *Roxb. fl. Ind.* 3. *p.* 708.—Cucurbita dioica, *Roxb. in E. I. C. mus. tab.* 213.—*Rheed. Mal.* 8. *t.* 14; *Burm. Zeyl. t.* 19. *f.* 1, 2.—*Rumph. Amb.* 5. *t.* 166. *f.* 1.—*β*; leaves deeply palmately 5-cleft, segments oblong, sinuate-lobed.—

Digitized by Google

Wight! cat. n. 1124.—B. palmata, *Linn.? herb. Madr.!*; *DC.? l. c. p.* 308; *Spr.? syst.* 3. *p.* 17; *Wall.! L. n.* 6711, *a*, *b*, *c.*——In almost every hedge.

VIII. MOMORDICA. *Linn.*; *Gærtn. fr.* 2. *t.* 88.

Flowers monœcious or dicœcious. Calyx 5-cleft. Corolla much longer than the calyx, cleft down to the calyx-segments.—MALE. Stamens triadelphous.—FEM. Style 3-fid. Pepo fleshy, bursting when ripe, with or without elastic force. Seeds enveloped in a fleshy arillus.

We have considerable doubts if *M. tubiflora*, Roxb. (*Cucumis tubiflorus*, Roxb. in E. I. C. mus. tab. 1696, and apparently *M. spicata*, Linn. mst.) ought not to be removed from the genus: the fruit is smooth, and bursts slowly and not with elasticity. The true species, and among them all the Peninsular ones, form a very natural group; they have a short calyx, the corolla 5-partite, a muricated or prickly fruit, that bursts elastically, the peduncles of both sexes solitary, the male one, and sometimes the female also, furnished with a large cordate bracteole.

* 1085. (1) M. *Balsamina* (Linn.:) annual: stems glabrous: leaves palmately 5-lobed, deeply toothed, glabrous, shining; peduncles with a toothed cordate bracteole: fruit roundish-ovate, attenuated at both ends, tubercled, bursting irregularly and laterally: seeds with a red arillus.—*DC. prod.* 3. *p.* 311; *Spr. syst.* 3. *p.* 14.—*Moris. hist.* 1. *t.* 6. *f.* 9.

Willdenow describes the bracteoles to be above the middle of the peduncle; Seringe below the middle; but this discrepancy may be explained by the one having in view the male, the other the female peduncles: in the specimen we ourselves possess all the flowers happen to be male, and the bracteole is placed close to the flower, as in *M. dioica*, from which it differs by the bracteole being toothed.

1086. (2) M. *charantia* (Linn.:) stems more or less hairy or villous: leaves palmately 5-lobed, sinuate-toothed, when young more or less villous on the under side, particularly on the nerves: peduncles slender with a reniform bracteole; male ones with the bracteole about the middle, female with it near the base; calyx-segments oblong: fruit oblong or ovate, tapering at both ends, more or less tubercled or muricated: seeds with a thick notched margin and red arillus.—*α*; fruit longer and more oblong, tubercled.—*Linn. sp. p.* 1433; *Wight! cat. n.* 1125.—M. charantia, *Willd. sp.* 4. *p.* 602: *DC. prod.* 2. *p.* 311 (*α*); *Spr. syst.* 3. *p.* 14; *Roxb. fl. Ind.* 3. *p.* 707; *Wall.! L. n.* 6746.—*Rheed. Mal.* 8. *t.* 9; *Rumph. Amb.* 5. *t.* 151.—*β*; fruit smaller, more ovate, muricated and tubercled.—*Linn. l. c.*; *Ser. in. DC. l. c.*; *Wight! cat. n.* 1126.—M. muricata, *Willd. l. c.*; *DC. l. c.*; *Spr. l. c. p.* 15; *Roxb. l. c.*; *Wall.! L. n.* 6745.—*Rheed. Mal.* 8. *t.* 10.

These two varieties present the extreme forms of the fruit, but there are innumerable intermediate gradations.

1087. (3) M. *dioica* (Roxb.:) dicœcious: root tuberous, perennial: stems glabrous or rarely slightly hairy: leaves longish petioled, cordate at the base, from entire to 3–4-lobed, toothed, upper side slightly scabrous, under smooth or nearly so: petioles without glands: peduncles slender, with entire bracteoles; male with the bracteole close to the flower, cucullate, and concealing the lower part of the flower; female with a smallish one near the base: calyx-segments subulate: petals lanceolate: fruit (about the size and shape of a partridge-egg) ovate, muricated: seeds oval, surrounded with a large red arillus.—*α*; leaves cordate, acuminated, usually entire.—*Wight! cat. n.* 1127.—M. dioica, *Willd. sp.* 4. *p.* 605; *DC. prod.* 3. *p.* 312; *Spr. syst.* 3. *p.* 14.—M. Missionis, *Wall.! L. n.* 6739.—*Rheed. Mal.* 8. *t.* 12 (fem.)—*β*; leaves 3–5-lobed, lobes irregularly toothed.—*Wight! cat. n.* 1128.—M. dioica, *Roxb. fl. Ind.* 3. *p.* 709; *in E. I. C. mus. tab* 455.—*Rheed. Mal.* 8. *t.* 18 (male).—*γ*; leaves deeply and sometimes palmately lobed, the lobes sinuated and slightly lobed.—*Wight! cat. n.* 1129.—M. Balsamina, *Wall.! L. n.* 6741.

Digitized by Google

In some specimens of Wight, cat. n. 1129. the bracteas are woolly on the outside.

1088. (4) M. *mixta* (Roxb.:) dicœcious: root tuberous, perennial: stems glabrous: leaves 3–5-lobed or palmate, glabrous; lobes oblong, nearly quite entire, or sometimes toothed; petioles and margin of the leaves near their base, furnished with several large umbilicated glands: peduncles (both male and female) with a large cucullate bracteole close to the flowers and enclosing its lower part; the bracteoles emarginate, a little scabrous, particularly on the margin near the base where the hairs proceed from glands: calyx campanulate: petals ovate: fruit (6–8 inches long and 3–4 thick) oval, sharply muricated.—*Roxb. hort. Bengh. p.* 70; *fl. Ind.* 3. *p.* 709; *in E. I. C. mus. tab.* 993; *Wight! cat. n.* 1130.—M. cochinchensis, *Spr. syst.* 3. *p.* 14.—Muricia cochinchensis, *Lour. coch.* 2. *p.* 733.

Our specimens were obtained from the Madras herbarium, without any name or locality affixed. Roxburgh says it is a native of the thickets about Calcutta, but we do not observe it mentioned in Wallich's List. Our description of the fruit is taken from Roxburgh's drawings: the seeds are represented orbicular, about fully three-fourths of an inch in diameter.

†1089. (5) M.? *Heyneana* (Wall.)—*Wall. L. n.* 6744.

†1090. (6) M. *humilis* (herb. Madr.)—*Wall. L. n.* 6747.

IX. TRICHOSANTHES. *Linn.*

Flowers monœcious, rarely dicœcious.—MALE. Calyx somewhat clavate, 5-cleft; segments subulate. Corolla 5-partite, ciliated. Stamens 5, triadelphous. Anthers very flexuose.—FEM. Calyx 5-toothed. Corolla 5-partite, cut and ciliated. Style 3-fid. Stigmas oblong-subulate. Peponida oblong or globose. Seeds imbedded in pulp.—Male flowers usually racemose, rarely solitary: female generally solitary, rarely racemose.

The genus *Involucraria* of Seringe (Mem. sur les Cucurb. t. 5) is scarcely distinct from *Trichosanthes*, and is very closely allied to *T. palmata*, *T. globosa*, Blume, and *T. heteroclita*, Roxb.; these species, as well as *T. cordata* Roxb. (*T. tuberosa*, Roxb. in E. I. C. mus. tab. 1691), having large bracteas on the raceme of male flowers. From the specimens being much too little advanced, Seringe's figure represents the bracteas and flowers as forming a short head instead of racemes.

Subgen. 1. EUTRICHOSANTHES.—Bracteas on the male racemes minute, many times shorter than the pedicels. Filaments and anthers triadelphous.

1091. (1) T. *nervifolia* (Linn.:) stem nearly glabrous and smooth: leaves cordate-acuminated, minutely and sharply bristle-toothed, glabrous and smooth, marked beneath with the prominent nerves and veins: tendrils bifid: male flowers long-pedicelled on a very short simple or sometimes branched peduncle: female solitary: fruit ovate.—*DC. prod.* 3. *p.* 314; *Spr. syst.* 3. *p.* 17; *Wight! cat. n.* 1131.—*Rheed. Mal.* 8. *t.* 17.——Malabar.

†1092. (2) T. *cuspidata* (Lam.:) leaves cordate-acuminated, sharply toothed, marked beneath with the prominent nerves and veins: tendrils simple: female flowers solitary: fruit turbinate-ovate, terminated by the tube of the calyx.—*Lam. enc. meth.* 1. *p.* 188; *DC. prod.* 3. *p.* 314.—T. caudata, *Willd. sp.* 4. *p.* 600; *Spr. syst.* 3. *p.* 17.—*Rheed. Mal.* 8. *t.* 16.——Malabar.

This species has been seen by no modern botanist, the descriptions being all taken from Rheede. We suspect that the figure was made from a young plant, an opinion which is confirmed by the diminutive seeds; and, if we be correct, there is nothing to prevent this species being considered identical with the last, the tendrils of which sometimes also appear simple by the almost total abortion of one of their divisions.

Digitized by Google

1093. (3.) T. *anguina* (Linn.:) annual, climbing: leaves more or less 5-lobed: tendrils 3-fid: male flowers in a long peduncled raceme, with small entire bracteas at the base of the pedicels; female solitary on a short peduncle from the same axils with the male: fruit spindle-shaped.—*DC. prod.* 3. *p.* 314; *Spr. syst.* 3. *p.* 17; *Lam. ill. t.* 794; *Roxb. fl. Ind.* 3. *p.* 701; *Wall.! L. n.* 6687 (partly); *Wight! cat. n.* 1132.—Cucumis anguinus, *Linn.* (according to *Lamarck*).—*Rumph. Amb.* 5. *t.* 148.

1094. (4) T. *cucumerina* (Linn.:) annual, climbing: leaves broadly cordate, 3–7-angled or lobed, toothed or serrated, pubescent or glabrous: tendrils 3-cleft: male flowers shortly racemose at the apex of a long peduncle; female solitary, short-peduncled, often from the same axils with the males: fruit ovate, pointed.—*Roxb. fl. Ind.* 3. *p.* 702; *Wall.! L. n.* 6690.—*α*; leaves angled, repandly toothed.—*Wight! cat. n.* 1133.—T. cucumerina, *Linn.; DC. prod.* 3. *p.* 315; *Spr. syst.* 3. *p.* 18; *Roxb. in E. I. C. mus. tab.* 454.—*Rheed. Mal.* 8. *t.* 15.—*β*; leaves lobed, lobes obovate or rounded, toothed.—*Wight! cat. n.* 1134.—T. laciniosa, *herb. Madr.; Rottl.!; Klein in Willd. sp.* 4. *p.* 601; *DC. l. c.; Spr. l. c.*—*γ*; leaves lobed, lobes acute or acuminated, serrated.—*Wight! cat. n.* 1135.

There appear to be many gradations between these two varieties. We have some doubts if *T. lobata*, Roxb. (in E. I. C. mus. tab. 992), be not another form of this species: it only differs from our var. *β*, by the fruit being linear-oblong and pointed, not ovate.

Subgen. 2. INVOLUCRARIA.—Bracteas on the male racemes large, foliaceous, many times longer than the very short pedicels. Filaments 3-adelphous. Anthers syngenesious, very anfractuose.

1095. (5) T. *palmata* (Roxb.:) perennial, climbing: leaves palmately-lobed, toothed, with usually a few flat glands scattered on the under side: tendrils 3-cleft: male-flowers racemose, with a large ovate or obovate cut and toothed bracteole at the base of each very short pedicel; female solitary in the same axils as the male, or occasionally racemose: calyx-segments ovate, deeply toothed or serrated: fruit globose: seeds pretty numerous, oblong, compressed.—*α*; leaves glabrous, sometimes slightly scabrous, deeply lobed; the lobes sometimes again lobed and with the segments narrow linear-lanceolate.—*Wight! cat. n.* 1136.—*β*; leaves glabrous or slightly scabrous, palmately lobed; lobes broad-lanceolate or oblong, entire or again lobed.—*Wight! cat. n.* 1137.—T. palmata, *Roxb. fl. Ind.* 3. *p.* 704; *Wall.! L. n.* 6688.—T. kakidonda, *Roxb. in E. I. C. mus. tab.* 453.—T. laciniosa, *Wight! in Wall.! L. n.* 6689.—T. anguina, *Wall.! L. n.* 6687, *f.*—Modecca bracteata, *Lam. enc. meth.* 4. *p.* 210; *DC. prod.* 3. *p.* 337; *Spr. syst.* 3. *p.* 45.—*γ*; leaves palmately lobed, pubescent (when young) on the under side; lobes ovate or oblong.—*Wight! cat. n.* 1138.—T. cucumerina, *herb. Rottl.!; Klein!; Wall. L. n.* 6690. *a*?—T. cordata, *Wall. L. n.* 6687, *e*?

It is not improbable that *Involucraria Wallichii*, Ser., belongs to this species; the specimen is obviously very little advanced, the flowers not being expanded, and in that state the calyx appears sometimes as if quite entire: the peduncle, however, of the female flower, if intended for our plant, is represented too long.

X. CUCURBITA. *Linn.; Gærtn. fr.* 2. *t.* 88. *f.* 5.

Flowers monœcious. Corolla campanulate, 5-cleft, the petals being much united with each other.—MALE. Calyx campanulate. Stamens 5, triadelphous, converging.—FEM. Calyx obovate-clavate, after flowering splitting across below the limb. Anthers often sterile. Style 3-fid. Stigmas 3, thick-

Digitized by Google

ened and 2-lobed. Peponida fleshy. Seed ovate, compressed, with a tumid margin.—Flowers yellow.

1096. (1) C. *maxima* (Duch.:) leaves cordate, rugose, harshly and densely pubescent on the under side: petioles hispid: flowers campanulate, broad at the base: segments of the calyx often dilated at the apex into an obovate-oblong toothed foliaceous limb: divisions of the corolla recurved: fruit large, roundish, glabrous, torulose.—*Lam. enc. meth.* 2. *p.* 149, 151; *Ser. in DC. prod.* 3. *p.* 316; *Wall.*? *L. n.* 6720; *Wight! cat. n.* 1140.—C. Melopepo, *Roxb. fl. Ind.* 3. *p.* 719; *Spr.*? *syst.* 3. *p.* 46.—*Rheed. Mal.* 8. *t.* 2 (good).

That this is the plant of Rheede there is no doubt, but it is singular that, although his figure be excellent, no botanist, except Roxburgh, refers to it. Can this be *C. Melopepo* of Linnæus. We have no means of ascertaining to what *C. Melopepo*? Russ. in Wall. L. n. 6725, ought to be referred: it probably is a variety of *C. Pepo*. From the want of good figures scarcely one botanist knows what species of this genus is intended by another.

1097. (2) C. *Pepo* (Linn.:) leaves cordate, obtuse, somewhat 5-lobed, toothed, hirsute: flowers obconical-campanulate, tapering towards the base: divisions of the corolla straight and erect: fruit roundish or oblong, smooth. *DC. prod.* 3. *p.* 317; *Spr. syst.* 3. *p.* 46; *Wall. L. n.* 6722.—C. polymorpha var. oblonga, *Duch. in Lam. enc. meth.* 2. *p.* 155.—*Moris. hist.* 1. *t.* 5. *f.* 4, 5?, 6.

Probably, as suggested by Duchesne, all the species which have the flowers obconical or tapering at the base with a straight limb to the corolla, ought to be referred here, whatever be the size or appearance of the fruit.

1098. (3) C.? *Citrullus* (Linn.:) leaves 3–5-partite, rough on the under side, the segments sinuate-pinnatifid, obtuse: corolla rotate: fruit somewhat globose, stellately spotted.—*Spr. syst.* 3. *p.* 46; *Roxb. fl. Ind.* 3. *p.* 719.; *Wall.! L. n.* 6717; *Wight! cat. n.* 1141.—Cucumis Citrullus, *Ser. in DC. prod.* 3. *p.* 301.—*Rumph. Amb.* 5. *t.* 146. *f.* 1; *Moris. hist.* 1. *t.* 6. *f.* 2; *Pluk. t.* 164. *f.* 1.

Although we leave this, with Linnæus and most botanists, in *Cucurbita*, we have considerable doubts of the propriety of so doing: its habit, texture of the leaves, shape of the corolla, nature of the fruit and its rind, are much at variance with the others; but we can scarcely agree to remove it to *Cucumis*, as has been done by Seringe, although in more than one point it bears a considerable affinity to *C. Colocynthis*.

ORDER LXVIII.—PAPAYACEÆ. *Agardh.*

Flowers unisexual. Calyx minute, 5-toothed. Corolla monopetalous, inserted into the base of the calyx, in the male tubular and 5-lobed; in the female divided nearly to the base into five segments. Stamens 10, inserted on the throat of the corolla: anthers introrse, 2-celled, bursting longitudinally; those alternate with the lobes of the corolla on short filaments, those opposite to the lobes sessile. Ovarium free, 1-celled: ovules indefinite: stigmas sessile, 5-lobed, lacerated. Placentas 5, parietal. Fruit succulent, indehiscent, 1-celled. Seeds indefinite, parietal, enveloped in a loose mucous coat: testa brittle, pitted. Embryo in the axis of a fleshy albumen: radicle slender, turned towards the hilum: cotyledons flat. — Trees without branches. Leaves alternate, lobed, on long slender petioles.

Digitized by Google

I. CARICA. *Linn.*—Papaya. *Gærtn. fr.* 2. *t.* 122. *f.* 2; *Lam. ill. t.* 821.

Character the same as of the order.

1099. (1) C. *Papaya* (Linn.:) leaves palmate, 7-partite; segments oblong, acute, sinuated, the middle one 3-fid: fruit oblong, furrowed.—*Linn. sp. p.* 1466; *Spr. syst.* 3. *p.* 905; *Bot. reg. t.* 459; *Bot. mag. t.* 2898, 2899; *Roxb. fl. Ind.* 3. *p.* 824; *Wall. L. n.* 6767; *Wight! cat. n.* 1153.—Papaya vulgaris, *Lam.*—P. Carica, *Gærtn.*—*Rheed. Mal.* 1. *t.* 15. *f.* 1. and 2; *Rumph. Amb.* 1. *t.* 50.

This tree is now generally allowed to have been introduced into India from America.

ORDER LXIX.—PASSIFLOREÆ. *Juss.*

Sepals 5 (rarely 4), foliaceous, united below into a short or elongated tube, the sides and throat of which are lined with a *corona* composed of filamentous or annular processes. Petals perigynous, inserted between the corona and the calyx-segments, with which last they are as numerous and alternate, usually almost homogeneous with and shorter than them, very rarely larger than them and with the usual appearance of petals, sometimes wanting. Stamens 5 (very rarely indefinite), monadelphous, usually with processes from the torus between them and the petals: anthers inserted by their base, 2-celled, bursting longitudinally on the inner side (but, from their being often reflexed, apparently opening outwardly). Ovarium free, 1-celled: ovules indefinite, attached to 3 (or very rarely 4) parietal placentæ: styles 3 (or very rarely 4), or none. Fruit naked or surrounded by the calyx, 1-celled, usually 3-valved, sometimes dehiscent and loculicide, sometimes fleshy and indehiscent. Seeds indefinite, compressed, with an arillus or strophida: testa brittle, sculptured. Embryo straight, in the centre of a thin fleshy albumen: radicle pointing to the hilum.

TRIBE I.—PASSIFLOREÆ. *DC.*

Petals shorter than the calyx-segments, or wanting. Stamens 5 (very rarely 4), opposite the divisions of the calyx. Ovary usually stalked: stigma sessile, 3-lobed. Fruit fleshy or capsular. Seeds with a pulpy arillus: cotyledons foliaceous.—Usually climbing plants, with axillary tendrils. Leaves alternate, stipuled, usually with glands on the petioles.

I. PASSIFLORA. *Linn.; Lam. ill. t.* 732.—Granadilla, *Tourn.; Gærtn. fr.* 1. *t.* 60. *f.* 5; *and* 2. *t.* 177. *f.* 1.

Flowers bisexual. Calyx-tube very short. Corona composed of numerous filaments in several rows. Anthers reflexed. Berry stalked, usually pulpy, rarely somewhat membranaceous.

1100. (1) P. *Leschenaultii* (DC.:) climbing: leaves half-orbicular, rounded at the base, somewhat truncated and 3-cuspidate at the apex, pubescent on the under side but particularly so on the nerves, without glands: petioles with two glands about their middle: tendrils simple: peduncles in pairs from the same axils as the tendrils, simple, 1-flowered: calyx without an involu-

Digitized by Google

cre; petals 5.—*DC. prod.* 3. *p.* 326; *Wall.! L. n.* 1231; *Wight! cat. n.* 1154. ——Neelgherries.

† 1101. (2) P. *Heyneana* (Wall.)—*Wall.! L. n.* 2248.
Dr Wallich is doubtful if this be not a species of *Modecca:* can it be the same with *M. Wightiana,* Wall.?

II. MODECCA. *Lam.; Roxb.; DC.*

Flowers unisexual. Calyx campanulate: tube short. MALE. Stamens 5; filaments cohering into a membranaceous tube at the base: anthers erect. FEM. Ovary shortly stalked, surrounded with 5 sterile longish filaments. Stigmas 3, petaloid. Capsule fleshy (when dry coriaceous and vesicular), 3-valved. Seeds numerous, arillate, scrobiculate.—Peduncles cirrhiferous.

The two very different kinds of petals found in this genus have induced us to adopt for the present Mr Lindley's views relative to these organs in this natural order: in our first subgenus they resemble most of those of the other genera both in texture and situation; but in our second they are so very dissimilar in both respects, that it was some time before we could persuade ourselves to admit their being congeners.—*M. diversifolia,* Wall. ! L. n. 6763, is *Vitis lanceolaria; M. bracteata,* Lam., is *Trichosanthes palmata,* Roxb.

Subgen. 1. MICROBLEPHARIS.—Calyx-tube conical-campanulate: limb 5-partite; segments ovate, bluntish. Petals 5, ovate, entire, slightly shorter and more tender than the calyx-segments, inserted immediately below the sinus. Corona composed of a fringe of short soft hairs. MALE. Stamen-tube pretty long, membranaceous. Anthers shortly oval. Abortive filaments 5, short, situated on the bottom of the calyx opposite to the stamens. FEM. Abortive filaments as in the male. Fruit-stalk not longer than the calyx-tube.

1102. (1) M. *Wightiana* (Wall.:) leaves glabrous, from ovate entire rounded or slightly cordate at the base, to hastate or palmately lobed, with a large glandular projection at the apex of the petiole on its upper surface: stigmas cuneate, fringed.—*Wall.! L. n.* 6764; *Wight! cat. n.* 1155.——Alpine Jungles. Madura. Narthamala.

Subgen. 2. BLEPHARANTHES (*Smith's gramm. bot. p.* 188).—Calyx-tube saucer-shaped, usually with 5–10 external gibbosities and internal corresponding cavities: limb cylindrical, shortly 5-cleft; segments ovate, erect and acute. Petals 5, linear acuminated, ciliated, inserted at the base of the limb of the calyx (far below the sinus), membranaceous, included within the calyx. Corona a simple row of hairs fringing the hollow of the calyx-tube on the inside. MALE. Stamen-tube connected at the base with the base of the petals by membranous expansions: anthers linear. Abortive filaments 5, short, revolute, inserted in the hollows of the calyx-tube and opposite to the stamens (sometimes? wanting). FEM. Abortive filaments as in the male (always? present). Fruit-stalk elongated.

1103. (2) M. *palmata* (Lam.:) leaves from cordate acuminated (on young plants) to palmately 3–5-lobed, glabrous, with two flat glands at the base and one below each sinus between the lobes: stipules hardening and horn-like: male and female flowers both with 5 abortive short filaments placed within the gibbosities of the calyx-tube: capsule globular.—*Lam. enc. meth.* 4. *p.* 209; *Vahl, in Skriv. naturh. Selsk. Kiøvenhag.* 6. *p.* 103; *DC. prod.* 3. *p.* 336; *Spr. syst.* 3. *p.* 45; *Wall.! L. n.* 6762; *Wight! cat. n.* 1156.—M. tuberosa, *Roxb. fl. Ind.* 3. *p.* 134.—M. integrifolia, *Lam. l. c.; DC. l. c.; Spr. l. c.—Rheed. Mal.* 8. *t.* 20, 21, 22, 23.——Courtallum. Malabar.

Digitized by Google

"A most extensive perennial climbing plant, with a large fusiform root, a considerable portion of which is above ground, tapering from the surface of the ground into the stem, which in a few years becomes ligneous."—ROXB. —Rheed. t. 23. represents the foliage of a young plant; t. 22. an accidental state, not worth noticing, with only two valves to the fruit, which is consequently oblong and not globular; his other two figures represent the male and female flowers of the common form: the omission of the ciliated petals in some of them we consider of little consequence (although trusted to by De Candolle), as no such difference is noticed in the descriptions.

ORDER LXX.—PORTULACEÆ. *Juss.*

Sepals generally 2, seldom 3 or 5, cohering at the base. Petals usually 5, sometimes 3, 4, or 6, or rarely wanting, distinct, or cohering at the base, inserted into the bottom of the calyx, sometimes almost hypogynous, alternating with the sepals when of the same number. Stamens inserted with the petals, variable in number, all fertile: filaments distinct, opposite to the petals or alternating with the sepals when of the same number: anthers versatile, 2-celled, bursting longitudinally. Ovarium 1, free, 1-celled: style rarely simple with a simple stigma, usually cleft at the apex or to the base into 2–3 or more filiform segments (stigmas ?) papillose on the inner side. Capsule 1-celled, dehiscing transversely (a pyxidium), or by 3 valves. Seeds numerous, or few (1, 2, 3, or 4), usually attached to a central placenta or to the base of the fruit, very rarely to parietal placentas, campulitropous: testa usually crustaceous and black. Embryo curved round the circumference of a farinaceous albumen: radicle long.—Succulent plants. Leaves usually alternate, without stipules, or with scarious ones at each side at the base.

I. TRIANTHEMA. *Linn.; Lam. ill. t. 375; Gærtn. fr. 2. t. 128. f. 5.*

Calyx 5-sepaled: sepals united at the base, mucronate below the apex, slightly coloured on the inner surface. Petals none. Stamens 5 or 10 or more, inserted on the tube of the calyx. Anthers cordate-ovate. Ovary ovate. Style simple or 2–3-partite. Capsule 1-celled (or with a spurious longitudinal dissepiment projected from the placenta when the style is 2-partite), splitting transversely a little above the base: lid coriaceous, containing 1–2 seeds attached to an unilateral placenta: bottom membranaceous, with 1 or more seeds attached to an unilateral placenta on the opposite side from that in the lid. Seeds pitted.—Herbaceous plants more or less fleshy, sometimes suffrutescent at the base. Leaves opposite, very entire, petioled, the petiole dilated on each side into a stipule-shaped membrane. Flowers axillary, solitary or fascicled, sessile or on short pedicels.

We have altered the character of the order slightly for the reception of this genus, which, although all agree to refer to Portulaceæ, no one that we know of has noticed how widely it differs from the other genera in the placentation. Perhaps the dissepiment, found in some species, ought to be regarded as true and not spurious, in which case we see little to prevent the whole genus being placed near *Sesuvium*, among the *Ficoideæ*: we are induced, however, to view it as spurious from the placentæ not being attached to its middle, but placed in the angle formed by it and the wall of the capsule, and because, although it be perfect below, it is imperfect in the

Digitized by Google

lid. We do not know *T. polyandra* of Blume; it is said to have a tripartite style, and may therefore clear up the point.

§ 1. *Style simple: lid with one seed.*

1004. (1) T. *crystallina* (Vahl:) perennial, cespitose, woody at the base: stems diffuse, prostrate, dotted with crystalline specks: leaves oval or somewhat spathulate: flowers several together, protruded from the sheath of the leaves: stamens 5: style simple: capsule 2-seeded; lid cup-shaped at the apex externally, quite open at the bottom and allowing the seed to drop off. —*α*; stems usually filiform; leaves approximated on the branches, short, about 4–5 lines long.—*Vahl, symb.* 1. *p.* 32; *DC. prod.* 3. *p.* 352; *Spr. syst.* 2. *p.* 381; *Roxb. fl. Ind.* 2. *p.* 444; *in E. I. C. mus. tab.* 647; *Wall.! L. n.* 6840, *a*; *Wight! cat. n.* 1157.—T. triquetra, *Rottl.!*; *Willd. in nov. act. nat. cur. Berol.* 4. *p.* 180; *DC. l. c.*; *Spr. l. c.*—Papularia crystallina, *Forsk.*—*β*; stems shorter; leaves distant, about an inch long.—*Wight! cat. n.* 1158.—T. crystallina, *Wall.! L. n.* 6840, *b.*

In this species the lid is quite open below, so that upon its removal the upper seed is found generally lying on the top of the other in the bottom of the capsule: the lower side of the upper seed, and upper of the under one, are often flat, so that the two together sometimes appears as if constituting one seed: Roxburgh had evidently been deceived by this, as he describes the "seed solitary."

1105. (2) T. *obcordata* (Roxb.:) perennial; stems diffuse, prostrate, slightly pubescent on the upper side: leaves, one of each pair larger and obovate or obcordate, the other smaller and oblong: flowers solitary, sessile, nearly concealed within the broad sheath of the petioles: stamens 15–20: style simple: capsule 6–8-seeded; lid concave with two spreading teeth, nearly quite closed at the bottom, nut-like, and including one seed.—*Roxb. hort. Bengh. p.* 34; *fl. Ind.* 2. *p.* 445; *Wall.! L. n.* 6837; *Wight! cat. n.* 1159.—T. monogyna, *herb. Madr.!*; *Roxb. in E. I. C. mus. tab.* 648.—T. pentandra, *β* obcordata, *DC. prod.* 3. *p.* 352.

§ 2. *Style divided to the base into two linear longish segments: lid with two seeds.*

1106. (3) T. *decandra* (Linn.:) annual: stems diffuse, prostrate, glabrous or pubescent on the upper side: leaves elliptic, obtuse or acute, petioled, one of each pair a little larger than the other: flowers several, pedicelled on a short peduncle, accompanied with scariose bracteas and bracteoles: sepals membranaceous on the margin: stamens 10–12: style bipartite: capsule 4-seeded, with a spurious dissepiment; lid slightly 2-lobed at the apex, nearly closed below, nut-like, and containing 2 seeds.—*Linn. mant. p.* 70; *DC. prod.* 3. *p.* 352; *Spr. syst.* 2. *p.* 381; *Roxb. fl. Ind.* 2. *p.* 444; *in E. I. C. mus. tab.* 649; *Wall.! L. n.* 6839; *Wight! cat. n.* 1160.—Zaleya decandra, *Burm. Ind. t.* 31. *f.* 3.—*Pluk. t.* 120. *f.* 3.

II. PORTULACA. *Tourn.*; *Linn.*

Calyx either free or cohering with the base of the ovary, 2-cleft, splitting transversely at the base and deciduous. Petals 4–6, inserted on the calyx, equal, distinct or cohering at the very base. Stamens 8–20: filaments distinct, sometimes adhering to the base of the corolla. Ovary roundish. Style 3–6-cleft at the apex, or 3–8-partite. Capsule globose or ovate, 1-celled, dehiscing transversely about the middle. Seeds numerous, attached by means of filiform podosperms to a central placenta.—Low herbaceous fleshy plants. Leaves scattered, quite entire, fleshy, often with hairs in their axils, somewhat verticellated about the flowers.

Digitized by Google

1107. (1) P. *oleracea* (Linn.:) annual, diffuse: leaves cuneiform, their axils and the joints naked: flowers sessile: petals 5: stamens 10–12: style 5-partite.—*DC. prod.* 3. *p.* 353; *Spr. syst.* 2. *p.* 459; *Roxb. fl. Ind.* 2. *p.* 463; *Wall.! L. n.* 6841; *Wight! cat. n.* 1161.

1108. (2) P. *quadrifida* (Linn.:) annual, diffuse, creeping, the joints and axils hairy: leaves oblong, flat: flowers terminal, nearly sessile, surrounded by four leaves: petals 4: stamens 8–12: style filiform, 4-cleft at the apex.—*Wall.! L. n.* 6843.—*α*; larger; stamens 10–12.—*DC. prod.* 3. *p.* 354; *Wight! cat. n.* 1162.—P. quadrifida, *Linn. mant. p.* 78; *Spr. syst.* 2. *p.* 459; *Roxb. fl. Ind.* 2. *p.* 464.—P. repens, *Roxb. in E. I. C. mus. tab.* 653.—*β*; smaller; stamens 6–8.—*DC. l. c.; Wight! cat. n.* 1163.—P. meridiana, *Linn. suppl. p.* 248; *Spr. l. c.*; *Roxb. fl. Ind.* 2. *p.* 463; *in E. I. C. mus. tab.* 652.—Illecetrum verticillatum, *Burm. Ind. p.* 66.—*Rheed. Mal.* 10. *t.* 31.

We can perceive no difference of any consequence between these varieties. Roxburgh, however, mentions that *P. quadrifida* is reckoned unwholesome and apt to produce stupefaction, and that the flowers expand about noon and continue open till sunset; but that *P. meridiana* is much used as a pot-herb, and that its flowers open at noon and shut at two.

1109. (3) P. *tuberosa* (Roxb.:) root tuberous: stems diffuse, the joints and axils of the leaves very slightly hairy: leaves linear-lanceolate: flowers terminal, sessile, surrounded by 6–8 leaves: petals 5: stamens about 20: style filiform, 5-cleft at the apex.—*Roxb. hort. Bengh. p.* 91; *fl. Ind.* 2. *p.* 464; *Wight! cat. n.* 1164.—P. cristata, *Wall. L. n.* 6844.——Circars. Wallajabad.

1110. (4) P. *suffruticosa* (Wight:) annual?; root woody, branched: stems erect?, somewhat woody at the base, branched: leaves linear, their axils and the joints very slightly hairy: flowers terminal, sessile, surrounded by 6–8 leaves: stamens about 16: style cleft to the middle into about five segments. —*Wight! in Wall. L. n.* 6842; *cat. n.* 1165.

1111. (5) P. *Wightiana* (Wall.:) annual?, diffuse, sometimes creeping: stems and branches naked at the base; joints approximated on the branchlets and with the axils clothed with numerous lanceolate scarious processes: leaves oblong, flat, with the margin recurved: flowers terminal, sessile among scarious processes, surrounded by a few leaves: petals 5?: stamens 6–8: style thicker upwards, 5–6-cleft at the apex.—*Wall. L. n.* 6845; *Wight! cat. n.* 1166.——Narthamala. Wallajabad. Sadras.

One of the most remarkable and distinct of the genus, having scarious membranes (like the stipules of *Paronychya*) in place of the axillary hairs found in most of the other species. The number of petals, stamens, and segments of the style, will require to be better determined from the living plant.

III. TALINUM. *Juss.*; *Sims.*; *DC.*

Calyx of two deciduous opposite ovate sepals. Petals 4–5, hypogynous or inserted on the base of the calyx, free or slightly cohering at the base. Stamens 10–20, inserted with the petals and often slightly attached to them. Style 3- (or occasionally but rarely 4-) cleft at the apex. Capsule 3-valved, 1-celled. Seeds numerous, attached to a central placenta.—Herbaceous or suffrutescent glabrous fleshy plants. Leaves alternate, quite entire. Flowers cymose, racemose, or panicled, fugacious.

1112. (1) T. *Indicum* (Wight:) shrubby, erect: leaves flat, cuneiform-obovate, obtuse, upper ones mucronate: panicle terminal, elongated, much branched; branches all dichotomous, and the branchlets and peduncles bracteated at their base: petals 4 (always?): ovary nearly globose: style filiform:

Digitized by Google

stigmas 3, distinct, spreading.—*Wight! cat. n.* 1167.—T. cuneifolium?, *Wall.! L. n.* 6847. *c.*——Chimmanackmoor.

All authors describe *T. cuneifolium* with the lowest peduncles (or branch of the panicle) bearing 3, or, according to Roxburgh (fl. Ind. 2. p. 465), sometimes 4 flowers: in our specimens it is as much divided as any of the upper ones. Dr Wallich's n. 5847. *b.* is from the Calcutta Botanic Garden and therefore probably Roxburgh's plant: his *a.* is from Nepal; these we have not seen, but he not only seems uncertain about either being the true *T. cuneifolium*, but also as to whether our plant be the same as the others. Perhaps all may prove to be luxuriant states of the Arabian plant.

ORDER LXXI.—PARONYCHIACEÆ. *St. Hil.*

Subord. 1. ILLECEBREÆ *(R. Brown).* **Sepals 5, sometimes distinct, sometimes more or less cohering. Petals between the lobes of the calyx, sometimes conspicuous, usually small and resembling sterile stamens, sometimes wanting. Stamens perigynous or hypogynous, opposite the sepals (when equal to them in number), some of them occasionally wanting: filaments distinct, or rarely united: anthers 2-celled. Ovarium free: styles 2 or 3, distinct or partially combined. Fruit small, 1-celled, an utricle, or a 3–5-valved capsule. Seeds either numerous upon a central placenta, or solitary and pendulous from a long funiculus arising from the bottom of the fruit. Embryo lying on one side of a farinaceous albumen, more or less curved: radicle pointing to the hilum: cotyledons small.—Leaves opposite or alternate, entire, with scarious stipules.**

I. POLYCARPÆA. *Lam.*—Hagea, *Ventn.*—Mollia, *Willd.*—Lahaya, *Roem. & Schult.*—Polia, *Lour.*

Calyx 5-partite or deeply 5-cleft; sepals flat, membranaceous on the margin, neither keeled nor mucronate. Petals and stamens 5, almost hypogynous. Style 1, filiform. Stigmas 3. Capsule 1-celled, 3-sided, 3-valved. Seeds numerous, attached to a central placenta.—Herbaceous or suffutescent plants, usually much branched. Leaves opposite, but apparently verticellate from the presence of very short axillary leafy branchlets. Stipules scariose. Flowers cymose or corymbose.

1113. (1) P. *spadicea* (Lam.:) suffruticose: stems diffuse, much branched, and the branches tomentose: leaves from oblong-lanceolate to linear or setaceous, a little obtuse or acute or mucronate, the younger ones slightly tomentose: cymes terminal, corymbose: sepals entirely scariose, lanceolate, acuminated, 2–3 times longer than the capsule.—*DC prod.* 3. *p.* 374.—Achyranthes corymbosa, *Willd. sp.* 1. *p.* 1200.—Lahaya corymbosa, *Schult? syst.* 5. *p.* 405.—Polia arenaria, *Lour.*—Mollia corymbosa, *Willd.?; Spr. syst.* 1. *p.* 795.—*α*; leaves oblong-lanceolate, obtusish; corymbs very dense.—*Wight! cat. n.* 1168.—P. spadicea, *Wall.! L. n.* 1512. *b* (*a* not seen).—*β*; leaves approximated, oblong-linear, scarcely longer than the stipules, lower ones somewhat acute, upper ones mucronate; corymbs very dense.—*Wight! cat. n.* 1169.—*γ*; leaves oblong-linear, bluntish or scarcely acute, more or less distant; corymbs slightly dense or lax.—*Wight! cat. n.* 1170.—P. densiflora, *Wall! L. n.* 1513 (partly).—*Rheed. Mal.* 10. *t.* 66.—*δ*; branches very slen-

Digitized by Google

der; leaves setaceous, mucronate; corymbs lax and slender.—*Wight! cat. n.* 1171.—P. subulata, *DC.? in Lam. enc. meth. 5. p. 25.*——Common.

Our last variety presents two forms: one a first year's growth, with the root the same as that of an annual, and the stem erect but dichotomously branched; of the other the root is at least two years old, and the stems diffuse as in our specific character: of both the leaves and whole habit are as slender as in the specimens of *P. corymbosa* (Wall. L. n. 1511. *c*) from Prome. This variety is thus intermediate between *P. spadicea* and *P. corymbosa*, and seems almost to unite the two species: we have, however, referred it to the former, as the first year's growth of a perennial or suffrutescent plant cannot show its true appearance so well as when more advanced. Dr Wallich's *P. densiflora* is composed partly of our var. *γ* and partly of *P. corymbosa*: both occur under the same letters.

1114. (2) P. *corymbosa* (Lam.:) stems ascending or erect, simple or with a few simple branches; young parts glabrous or tomentose: leaves narrow-linear or setaceous, mucronate: cymes terminal, dichotomous, rather lax: sepals entirely scariose, lanceolate, acuminated, 2–3 times longer than the capsule.—*DC. prod. 3. p. 374; Wall.! L. n. 1511; Wight! cat. n. 1172.*—P. densiflora, *Wall.! L. n. 1513* (partly).—P. Indica, *Lam. enc. meth. 5. p. 483.*—Achyranthes corymbosa, *Linn.*—Celosia corymbosa, *Willd.? sp. 1. p. 1200; Roxb. fl. Ind. 1. p. 681; (ed. Wall.) 2. p. 310.*—Mollia spadicea, *Willd.? en. hort. Berol.; Spr. syst. 1. p. 795.*—Lahaya spadicea, *Schult.? syst. 5. p. 405.*—*Burm. zeyl. t. 65. f. 2; Bocc. mus. t. 39; Pluk. t. 120. f. 2?*

It is almost impossible to extricate the synonyms of Willdenow, Schultes, and Sprengel, with any kind of satisfaction, from their characters being compounded partly of their own observations, and partly of the descriptions given by others of probably a different species: on the whole, however, we consider these botanists to have applied the name *spadicea* to the Linnæan *corymbosa*.

II. HAPALOSIA. *Wall.*

Calyx 5-partite, fleshy: segments somewhat navicular, membranaceous on the margin. Petals 5, shorter than the calyx. Stamens 3, inserted with the petals into the bottom of the calyx. Style 1, trifid. Capsule 1-celled, ovoid or somewhat 3-sided, 3-valved. Seeds numerous, attached by podosperms to a central placenta.—Annual diffuse branched plants. Leaves opposite, apparently verticellate as in the last genus. Stipules scariose. Flowers compactly corymbose.

Polycarpæa Memphitica of Delile probably belongs to this genus; we have only observed 3 stamens: indeed, as a species, we can point out no character to separate it from *H. Læflingiæ*, unless, as De Candolle affirms, the petals be quite entire, of which however we cannot satisfy ourselves.

1115. (1) H. *Læflingiæ* (Wall.:) stems much branched, more or less densely pubescent: leaves cuneate-oblong or spathulate, usually glabrous when old, sometimes pubescent or slightly woolly when young: corymbs terminal or in the forking of the branches: petals linear, truncated, toothed at the apex.—*Wall.! L. n. 6962; Wight! cat. n. 1173.*—Pharnaceum depressum, *Linn. mant. p. 564.*—Lœflingia Indica, *Retz, obs. p. 48; Roxb. fl. Ind. 1. p. 165; (ed. Wall.) 1. p. 169.*—Polycarpon pusillum, *Roxb. in E. I. C. mus. tab. 535.*—Polycarpæa depressa, *DC. prod. 3. p. 375.*—P. lanuginosa, *Wall. L. n. 1515. b.*—P. Benthamii, *Wall.? L. n. 1514.*

III. DRYMARIA. *Willd.*

Calyx 5-partite; segments herbaceous, membranaceous on the margin. Petals 5, bifid, inserted at the base of the urceolate torus. Stamens 5 (or

Digitized by Google

fewer by abortion), inserted on the summit of the torus. Styles 3. Capsule 1-celled, 3-valved, few- or many-seeded.—Herbaceous diffuse branched plants. Leaves opposite, with several small membranaceous bristle-like stipules connecting the petioles.

1116. (1) D. *cordata* (Willd.:) glabrous; leaves on a petiole shorter than the limb, roundish ovate, mucronulate, slightly attenuated or rounded or somewhat cordate at the base: peduncles axillary and terminal, dichotomous, many-flowered: calyx longer than the petals: stamens often 3: ovary 5–10-seeded.—*DC. prod.* 1. *p.* 395; *Spr. syst.* 1. *p.* 942; *Wight! cat. n.* 152.—D. retusa, *Wall.! L. n.* 647.—Holosteum cordatum, *Linn.; Lam. ill. t.* 51. *f.* 2.—Stellaria cordata, *Willd.; DC. l. c. p.* 396; *Spr. syst.* 2. *p.* 392.—— Dindygul hills.

Specimens from Porto-Rico as well as cultivated ones in Mr Arnott's herbarium, agree precisely with those from India: it is a plant met with in most mountainous situations throughout the tropics. The peduncles and calyx are sometimes pubescent.

ORDER LXXII.—CRASSULACEÆ. *DC.*

Sepals 3–20, more or less united at the base. Petals equal in number to the sepals and alternate with them, inserted upon the bottom of the calyx, either distinct or forming a gamopetalous corolla. Stamens inserted with the petals, equalling them in number and alternate, or twice as many, those opposite the petals being shortest, and arriving at perfection before the others: filaments distinct, subulate: anthers bilocular, bursting longitudinally. Nectariferous scales (abortive stamens), one at the base of each ovarium, sometimes obsolete. Ovaria equal in number to the petals, and opposite to them, 1-celled, and tapering each into a short style, distinct, or slightly connected at the base. Fruit of several follicles, opening by the ventral suture. Seeds variable in number. Embryo straight in the axis of a thin, fleshy albumen: radicle pointing to the hilum.—Leaves succulent (or very rarely membranaceous), entire, or pinnatifid, exstipulate.

I. KALANCHOE. *Adans.; DC.*—Vereia. *Andr.*—Verea. *Willd.*

Calyx 4-partite; the sepals scarcely combined at the base, narrow acute, somewhat distant. Corolla hypocrateriform; tube cylindrical: limb spreading 4-partite. Stamens 8, attached to the tube of the corolla at the base. Scales 4, linear. Carpels 4. Styles filiform.—Suffruticose fleshy plants. Leaves opposite, irregularly pinnatifid or ovate, usually toothed, thick. Cymes panicled, lax. Flowers yellow, or rarely reddish or whitish.

1117. (1) K. *grandiflora* (Wall.:) glabrous: leaves broadly obovate, crenated, upper ones obtuse: cyme corymbose, lax: sepals oblong, acute: segments of the corolla oval, bluntish, with a short hooked mucronate point.—*Wall.! L. n.* 7226; *Wight! cat. n.* 1174.—K. Wightiana, *Wall.! L. n.* 7225.——Dindygul hills, at an elevation of 3000 feet. Neelgherries.

1118. (2) K. *floribunda* (W. & A.:) upper parts of the stem and cyme covered with short spreading glandular hairs: upper leaves alternate, lanceolate, crenated, pubescent: cymes panicled; branches elongated, racemiform: sepals subulate: petals oblong, mucronate.—*Wight! cat. n.* 1175.—

Digitized by Google

K. spathulata, *Wall.! L. n.* 7224 (not *DC.*)—Cotyledon paniculata, *herb. Rottl.!*—C. corymbosa, *herb. Rottl.!*——Nundydroog.

† 1119. (3) K.? *heterophylla* (W. & A.:) glabrous: leaves "petioled, young plants tripartite, when more advanced simple, ovate-oblong, slightly laciniate: corymbs decompound." ROXB.—Cotyledon heterophylla, *Roxb. fl. Ind.* 2. *p.* 456.——Mysore; *Dr F. Buchanan Hamilton.*

1120. (4) K. *laciniata* (DC.:) leaves decomposed and pinnatifid, the segments oblong, acute, coarsely toothed; upper ones nearly entire: sepals lanceolate, acuminated, spreading, cyme panicled.—*DC. pl. gr. t.* 100; *prod.* 3. *p.* 395; *Wall.! L. n.* 7221; *Wight! cat. n.* 1176.—Cotyledon laciniata, *Linn.; Roxb. fl. Ind.* 2. *p.* 456; *in E. I. C. mus. tab.* 650.—Verea laciniata, *Spr. syst.* 2. *p.* 260.

We have before us two states of this plant; one perfectly glabrous, the other with the panicle and upper part of the stem very pubescent.

II. BRYOPHYLLUM. *Salisb.*—Physocalycium. *Vest.*

Calyx inflated, bladder-like before flowering, 4-cleft scarcely to the middle; the lobes valvate. Corolla hypogynous, gamopetalous, cylindrical, 4-cleft, bluntly 4-angled at the base; segments ovate-triangular, acute. Stamens 8, attached to the base of the corolla. Scales gland-like, compressed, square. Carpels 4, inconspicuously stalked. Styles filiform.—A fleshy, glabrous erect, branched, suffruticose plant. Leaves opposite, thick, petioled, sometimes unequally pinnated: leaflets 1–2 pairs, occasionally wanting; terminal one much larger than the others, sometimes solitary; all of them ovate, crenated, each crenature readily producing a new plant. Cymes panicled, terminal. Flowers yellowish, inclining to red.

1121. (1) B. *calycinum* (Salisb.)—*DC. prod.* 3. *p.* 396; *Wall.! L. n.* 7205; *Wight! in Hook. Bot. misc.* 3. *p.* 100. *suppl. t.* 31; *cat. n.* 1177.—Cotyledon pinnata, *Lam. enc. meth.* 2. *p.* 141.—C. rhizophylla, *Roxb. fl. Ind.* 2. *p.* 456; *in E. I. C. mus. tab.* 1243.—C. calycina, *Roth, nov. sp. p.* 217.—Calanchoe pinnata, *Pers.*—Verea pinnata, *Spr. syst.* 2. *p.* 260.

ORDER LXXIII.—SURIANEÆ. *Arn.*

Calyx 5-partite, persistent: æstivation twisted, imbricative. Petals 5, alternate with the sepals, distinct, inserted into the bottom of the calyx. Stamens 5, alternate with the petals, sometimes with 5 alternating ones that are occasionally abortive, all inserted with the petals: filaments persistent, distinct, subulate from a broad base, hairy below: anthers 2-celled, bursting longitudinally. Torus fleshy, filling up the bottom of the calyx, supporting the ovaries on its middle and the petals and stamens on its margin. Ovaries 5, opposite to the petals, 1-celled, distinct, each with a long style arising from the inner angle near the base. Ovules in pairs, collateral, erect, straight, with the foramen at the opposite extremity from the hilum. Fruit of 5 coriaceous pyriform indehiscent carpels. Seeds solitary, uncinate, attached to the base of the carpels. Albumen none. Embryo of the same shape as the seed: radicle as long as the cotyledons, at the opposite end from the hilum; cotyledons oblong, fleshy, incumbent.—Sea-side shrubs. Leaves sim-

Digitized by Google

ple, oblong-spathulate, thickish, pubescent, crowded at the apices of the branches, exstipulate. Flowers yellow, bracteated, somewhat terminal.

We scarcely know where to arrange the only genus of which this order is composed. Some refer it to *Rosaceæ*; Kunth purposes to place it near the *Geraniaceæ*: we think it has considerable affinity with the *Neuradeæ*, of which *Grielium* has been alternately referred to *Rosaceæ* and *Geraniaceæ*, and that it may be left near them (a suborder of *Ficoideæ*) and *Crassulaceæ*. We cannot see any resemblance to *Terebinthaceæ*, with which De Candolle arranges it. In some points it approaches the *Ochnaceæ*.

I. SURIANA. *Plum.; Linn.; Lam. ill. t.* 389.

Character the same as of the order.

1122. (1) S. *maritima* (Linn.)—*DC. prod.* 2. *p.* 91; *Spr. syst.* 2. *p.* 438; *Wight! cat. n.* 1178.—*Pluk. t.* 241. *f.* 5.

ORDER LXXIV.—FICOIDEÆ. *Juss.*

Subord. 1. AIZOIDEÆ (*Spreng.*) Sepals definite (usually 5, but varying from 4 to 8), more or less combined at their base, equal or unequal: æstivation valvate or imbricate. Petals indefinite, coloured, sometimes wanting. Stamens perigynous, distinct, definite or indefinite: anthers oblong, incumbent. Ovarium cohering with the tube of the calyx, or free, syncarpous, plurilocular (usually 5-celled): style wanting or very short: stigmas several, distinct, nearly or (almost always) quite sessile. Fruit with several cells, usually a capsule, and either bursting in a stellate form at the apex, or by valves, or transversely; rarely nut-like and indehiscent. Seeds usually indefinite, rarely definite or solitary. Embryo on the outside of a mealy albumen, curved or rarely spiral.—Leaves succulent, opposite or alternate, simple.

I. SESUVIUM. *Linn.; Lam. ill. t.* 434.

Calyx 5-partite, persistent; the segments coloured on the inner side. Petals none. Stamens 15–30, inserted into the bottom of the calyx at the apex of its short tube. Ovary free, sessile. Style none. Stigmas 3–5, linear. Capsule 3- or rarely 4–5-celled, dehiscing transversely: the axis and placentas persistent. Seeds numerous. Embryo curved like a hook.—Sea-side fleshy glabrous herbaceous plants. Leaves opposite, quite entire, almost veinless. Flowers axillary, alternate, solitary, sessile or shortly pedicellate.

1123. (1) S. *repens* (Rottl.!:) stems prostrate, throwing out roots at the joints, the extremities sometimes ascending: leaves oval, spathulate, or oblong-linear: flowers pedicellate: stigmas 3.—*Willd. enum. p.* 521; *DC. prod.* 3. *p.* 453; *Spr. syst.* 2. *p.* 504; *Wall.! L. n.* 5836; *Wight! cat. n.* 1179.—S. portulacastrum, *Roxb. fl. Ind.* 2. *p.* 509; *in E. I. C. mus. tab.* 655.—*Rumph. Amb.* 6. *t.* 72. *f.* 1.——Tranquebar, in moveable sand by the sea-shore.

Rottler seems to have distinguished two states of this: to the one, "caule subrepente, foliis orbiculatis, non edule," he gave the name of *S. repens*; and to the other, "caulibus ascendentibus, foliis cuneiformibus, edule," he gave that of *S. Portulacastrum*. In the herbarium, we cannot distinguish the two except by the shape of the leaves, and there are numerous gradations between

Digitized by Google

them; the stems creep in the one as well as in the other. From an examination of other supposed species of the genus, from America, we have nearly satisfied ourselves that all, the Indian one included, are mere varieties, if even they can be distinguished as such, of one species, which ought therefore to retain the name of *Portulacastrum*.

II. GLINUS. *Linn.; Lam. ill. t.* 413; *Gærtn. fr.* 2. *t.* 130.

Calyx 5-partite, connivent, persistent; three of the sepals exterior, two interior. Petals (abortive stamens?) 5 or numerous, shorter than the calyx, linear, cleft or torn at the apex, very tender, sometimes wanting. Stamens 5–20 (usually about 15). Ovary free. Style very short or wanting. Stigmas 5. Capsule surrounded with the calyx, 5-celled, loculicidal, 5-valved; the axis and dissepiments persistent. Seeds numerous, small or minute, attached to the axis by long involute podosperms. Embryo spiral or curved.—Procumbent diffuse herbaceous branched plants. Leaves alternate or in pairs, and unequal.

G. ononoides, figured in Burm. Ind. t. 36. f. 2, appears to belong to *Amaranthaceæ*.

§ 1. *Capsule membranaceous, opening from the apex downwards; the valves cohering with the axis at the apex: embryo spiral.*

1124. (1) G. *lotoides* (Linn.:) hoary with short stellate tomentum: leaves obovate, flat, fascicled, unequal: pedicels 1-flowered, axillary, usually twice as long as the petiole: petals 5, deeply cloven.—*Linn. sp. p.* 663; *Lam. ill. t.* 413. *f.* 1; *DC. prod.* 3. *p.* 455; *Spr. syst.* 2. *p.* 467; *Wall. L. n.* 1517; *Wight! cat. n.* 1180.—G. dictamnoides, *Lam. ill. t.* 413. *f.* 2; *Wall.! L. n.* 1518. *e.—Barrel. ic. t.* 336.

1125. (2) G. *dictamnoides* (Linn.:) hoary with short stellate tomentum: leaves roundish obovate, flat, fascicled, unequal: flowers almost sessile, axillary: petals 5, deeply cloven, or wanting: stamens 5–20.—*Linn. mant. p.* 243; *Vahl, symb.* 3. *p.* 64; *DC. prod.* 3. *p.* 455; *Spr. syst.* 2. *p.* 467; *Wall.! L. n.* 1518 (partly); *Wight! cat. n.* 1181.—G. lotoides, *Burm. Ind. t.* 36. *f.* 1.—Pharnaceum pentagonum, *Roxb. fl. Ind.* 2. *p.* 103.—Doosera esculenta, *Roxb. in E. I. C. mus. tab.* 1128.—*Pluk. t.* 356. *f.* 6; *and t.* 12. *f.* 3?

The length of the pedicel is surely too inconstant a distinction between this and the former, and we know of none other.

§ 2. *Capsule chartaceous, septifragal, the valves separating from the axis and the dissepiments: embryo curved round the albumen.*

1126. (3) G. *trianthemoides* (Heyne!:) glabrous: leaves cuneate-obovate, rounded, mucronate: panicles lax, opposite to the leaves: petals numerous, marcescent: stamens 12–15.—*Roth, nov. sp. p.* 231; *DC. prod.* 3. *p.* 455; *Spr. syst.* 2. *p.* 467; *Wight! cat. n.* 1182.—Linearum familiæ, *Wall.! L. p.* 249. *n.* 1543.

Perhaps this ought to form a distinct genus from *Glinus*, but the principal difference lies in the capsule. We cannot agree with Dr Wallich to refer it to the *Lineæ* *.

* As this plant is involved in some doubt, we give the following analysis:—*Calyx* 5-partitus, connivens, persistens, intus haud coloratus: sepalis ovalibus, cuspidatis, margine membranaceis, 3 exterioribus, 2 interioribus. *Petala* numerosa, liguliformia, tenerrima, marescentia, calyce breviora. *Stamina* 12–90: filamenta subulata, disco carnoso calycis fundum tegente inserta: antheræ oblongæ incumbentes, 2-loculares, longitudinaliter intus dehiscentes. *Ovarium* liberum, 5-loculare. *Stylus* 1, brevissimus. *Stigmata* 5, linearia, demum recurva. *Capsula* chartacea, 5-locularis, loculicido 5-valvis, valvæ a dissepimentis axi persistenti arcte adnatis solutæ, patulæ. *Semina* in quoque loculo numerosa, axi ope podospermi gracilis curvati affixa, cochleata: *testa* crustacea, longitudinaliter punctato-striata. *Albumen* farinaceum. *Embryo* semini conformis, circa albumen curvatus.

Digitized by Google

ORDER LXXV.—CACTEÆ. *Juss.*

Sepals numerous, usually indefinite and confounded with the petals, either crowning the ovarium or covering its whole surface. Petals numerous, usually indefinite, sometimes irregular, inserted at the mouth of the calyx. Stamens indefinite, cohering more or less with the petals and sepals: filaments long, filiform: anthers ovate, versatile. Ovarium fleshy, cohering with the tube of the calyx, 1-celled: ovules indefinite: style filiform: stigmas several. Placentæ parietal, as many as the stigmas. Fruit succulent, 1-celled. Seeds many, after having lost their adhesion nestling in a pulp, ovate or obovate. Albumen none: embryo straight, curved or spiral: radicle thick, obtuse, next the hilum.—Succulent shrubs. Leaves almost always wanting; when present fleshy, smooth, entire, or spiniform. Flowers sessile.

I. OPUNTIA. *Tourn.; DC.*

Sepals numerous, adnate to the ovary, leaf-shaped; uppermost ones flat, short; innermost petaloid, obovate, rosaceous, expanded: the tube not produced beyond the ovary. Stamens numerous, shorter than the petals. Style cylindrical, constricted at the base. Stigmas several, erect, thick. Berry ovate, umbilicated at the apex, tubercled and often bearing spines. Embryo somewhat spiral, nearly terete. Cotyledons semi-terete, during germination foliaceous flat and thick. Plumula small.—Shrubs. Trunk at length terete; when young, as well as the branches, jointed and usually more or less compressed; the joints ovate, obovate, or oblong, bearing tufts of spines or bristles. Leaves small, like those of a *Sedum*, very caducous, under each younger tuft. Flowers arising either from the tufts, or margins of the joints, yellow or reddish.

*1127. (1) O. *Dillenii* (Haw.:) erect: joints roundish-obovate, compressed, waved, glaucous: spines (yellowish) stout, one or more together, divaricating, inserted among and much longer than a tuft of short slender bristles: corolla (yellow) twice as long as the stamens: ovary shorter than the corolla, furnished with a few tufts of bristles around its apex.—*DC. prod.* 3. *p.* 472; *Wight tab.* (ined.)—Cactus Dillenii, *Ker in Bot. reg. t.* 255; *Spr. syst.* 2. *p.* 497.—C. Indicus, *Roxb. fl. Ind.* 2. *p.* 475.—*Dillen. Elth. t.* 296. *f.* 382.

Roxburgh is of opinion that this is a native of India: but it is much more probable that it was brought from America, and is now merely naturalized.

ORDER LXXVI.—SAXIFRAGACEÆ. *Juss.*

Sepals usually 5 (rarely 3, 4, 7, or 9), more or less cohering at their base: the limb usually persistent. Petals as many as sepals (except in *Donatia*), inserted on the tube of the calyx, alternate with its lobes, deciduous or persistent, very rarely wanting. Stamens perigynous, either equal to (or rarely fewer than) the petals, and alternate with them; or twice as many as the petals, some alternate, some opposite to them (in one species, by the abortion of the alternating stamens, there

Digitized by Google

are only 5, and opposite to the petals); or (in *Bauera*) indefinite: filaments subulate: anthers ovate, 2-celled, bursting longitudinally or (in *Bauera*) by two pores. Ovarium partly coherent with the tube of the calyx, formed of two (rarely 3–5) carpels, cohering by their introflexed sides or margins: styles as many as the carpels, distinct, or more or less combined: stigmas capitate or clavate. Placentæ along the introflexed margins of the carpels, either throughout the whole length, or at the base only, or at the apex, usually separating with the carpels, rarely attached to a central axis. Fruit capsular, usually of two (rarely 3–5) carpels or valves, the margins of which are either entirely introflexed, or partly introflexed, or scarcely at all and the fruit is then 1-celled: carpels dehiscing at the ventral suture, separating from each other, either from the base upwards, or from the apex downwards. Seeds usually numerous, rarely definite: albumen fleshy. Embryo small, in the midst of the albumen: radicle pointing towards the hilum.

TRIBE I.—SAXIFRAGEÆ. *DC.*

Petals 4–5, or wanting. Stamens 8–10, or 3–5. Ovarium adherent or free. Styles 2–3, distinct, or rarely combined.—Herbaceous plants. Leaves exstipulate, alternate, or rarely opposite. Flowers in a raceme or panicle, rarely solitary, all fertile.

I. VAHLIA. *Thunb.; Lam. ill. t.* 183.—Oldenlandia. *Roth; Smith; Spr.*

Calyx-tube cohering with the ovary: limb 5-partite, persistent: æstivation valvular. Petals 5, entire, spreading, shorter than the calyx. Stamens 5. Anthers versatile. Styles 2. Stigmas capitate. Capsule 1-celled, 2-valved, truncated at the apex, 5-furrowed, crowned with the limb of the calyx, many-seeded. Placentæ free, pendulous from the apex of the cell. Seeds convex on the outer side, concave on the inner, or minute oblong and somewhat angular or compressed.—Herbaceous, pubescent or slightly villous, dichotomously branched plants, natives of Africa and India. Leaves opposite, exstipulate, entire and quite entire, acute. Flowers yellow or white, axillary, shortly pedicelled, usually in pairs, with or without a common peduncle.

In Dr Wallich's List this genus is still referred to *Onagrariæ*.

1128. (1) V. *Oldenlandioides* (Roxb.:) stem erect, slightly pubescent: leaves linear-lanceolate, spreading, pubescent: peduncles solitary, rather shorter than the leaves, 2-flowered: capsules nearly globose: seeds minute. —*Roxb. hort. Bengh. p.* 86; *fl. Ind.* 2. *p.* 89; *Wight! cat. n.* 1183.—V. Oldenlandiæ, *DC. prod.* 4. *p.* 54; *Wall! L. n.* 7187.—Oldenlandia pentandra, *Retz, obs.* 4. *p.* 22.—O. dichotoma, *Spr. pug.* 2. *p.* 36.—O. biflora, *Roth, nov. sp. p.* 97; *Spr. syst.* 1. *p.* 446.—Heuchera dichotoma, *Murr.*—" Cyrilla Oldenlandoides, *Koen.*" (*Roxb.*)—C. Indica, *Koen.* (*herb. Madr.*)

1129. (2) V. *viscosa* (Roxb.:) stems diffuse or somewhat erect, pubescent, slightly glutinous: leaves oblong-lanceolate or linear, pubescent: flowers in pairs, almost sessile: capsules nearly globose: seeds minute.—*Roxb. hort. Bengh. p.* 86; *fl. Ind.* 2. *p.* 89; *Wight! cat. n.* 1184.—V. sessiliflora, *DC. prod.* 4. *p.* 54; *Wall.! L. n.* 7188.—Oldenlandia digyna, *Retz, obs.* 4. *p.* 23; *Spr. syst.* 1. *p.* 446.—O. decumbens, *Spr. pug.* 2. *p.* 36.—O. sessiliflora, *Sm. in Rees' cycl.*—" Cyrilla viscosa, *Koen.*" (*Roxb.*)

Digitized by Google

Cl. 3.—Epipetalæ. *Juss.*

Torus lining the tube of the calyx, and forming at its extremity a small disk (epigynous) on the summit of the ovary, which coheres with the calyx-tube. Petals distinct, and with the stamens, inserted upon the outside of the disk.

ORDER LXXVII.—UMBELLIFERÆ. *Juss.*

Calyx 4-toothed, or entire. Petals 5, inserted on the outside of a fleshy disc, around the top of the ovary, alternate with the teeth of the calyx, often inflexed at the point, the inflexed portion cohering with the middle vein of the lamina: æstivation somewhat imbricate, rarely valvate. Stamens 5, alternate with the petals, distinct, folded back during æstivation: anthers ovate, 2-celled, dehiscing longitudinally. Ovarium cohering entirely and closely with the calyx, crowned by a fleshy disc (an expansion of the torus), 2-celled: ovules solitary, pendulous: styles 2, simple; their bases more or less thickened and fleshy *(stylopodia)*, covering the disc and top of the ovary: stigmas simple. Fruit dry (a *cremocarpium)*, consisting of 2 carpels (or *mericarpia)* which adhere by their face *(commissura)* to a common axis *(carpophorum)*, but in maturity separate from it, and are pendulous: each mericarp indehiscent, traversed by 5 longitudinal primary ridges *(juga primaria)*, one opposite to each petal and each stamen; and often also by alternating secondary ones *(juga secundaria)*, the ridges being separated by channels or interstices. In the substance of the pericarp are linear ducts or canals *(vittæ)*, full of an oily or resinous matter; these are usually lodged in the interstices, sometimes below the ridges, rarely wanting. Seed pendulous, usually cohering with the carpel, rarely loose. Embryo minute, at the base (that is, at the apex of the fruit) of a copius horny albumen: radicle superior, pointing to the hilum.—Herbaceous or rarely suffrutescent plants: stems usually fistular and furrowed. Leaves alternate, very rarely opposite, simple (without articulations), variously cut, sometimes reduced to the petiole *(phyllodium)*. Flowers in umbels, the umbel sometimes capitate, usually with an involucre.

We have detailed the subdivisions of this order more than perhaps was necessary from the few genera and species yet known as natives of the Peninsula; we have, however, done so for the sake of those botanists in the east who may not have access to De Candolle's prodromus: for the same reason, we have added several species which we suspect to be only naturalised. We have been obliged to omit *Ammi Indicum*, Wall. L. n. 7208, or *Sison Ammi* of the Madras herbarium, not having seen it.

Digitized by Google

TRIBE I.—HYDROCOTYLEÆ. *Spr.; DC.*

Fruit compressed laterally. Mericarps convex or (rarely) acute on the back: primary ridges 5, sometimes obsolete; the lateral ones being either marginal or on the commissura: the intermediate ones most prominent: secondary ridges sometimes persistent and filiform, sometimes almost or entirely wanting. Vittæ none. Seed and albumen flattish in front.—Umbels simple or imperfect.

I. HYDROCOTYLE. *Tourn.; Linn.; Lam. ill. t.* 188; *Gærtn. fr. t.* 22.

Calyx-tube slightly compressed; limb with the margin obsolete. Petals ovate, entire, acute, spreading; their apex straight. Fruit laterally compressed and flattened. Mericarps without vittæ: primary ridges 5, filiform, the dorsal and lateral ones often obsolete, the intermediate ones enlarged. Seed carinately compressed.—Herbaceous or rarely suffrutescent plants, usually slender and aquatic. Umbels simple. Involucre few-leaved. Flowers sessile or pedicelled, whitish.

1130. (1) H. *Asiatica* (Linn.:) leaves attached by the margin, orbicular-reniform, equally crenated, 7-nerved, glabrous, or slightly villous on the under side when young: petioles and peduncles fascicled, sprinkled with soft hairs: umbels capitate, shortly peduncled, few- (3–4-)flowered: fruit orbicular, reticulated, with 4 ribs on each of the flat sides.—*DC. prod.* 4. *p.* 62; *Spr. syst.* 1. *p.* 875; *Roxb. fl. Ind.* 2. *p.* 88; *in E. I. C. mus. tab.* 1385; *Wall.! L. n.* 560; *Wight! cat. n.* 1185.—H. rotundifolia, *Wall.! L. n.* 562. *c.* (not *Roxb.*).—*Rheed. Mal.* 10. *t.* 46.

1131. (2) H. *tenella* (Don.:) cespitose, creeping, glabrous: petiole usually solitary, slender: leaves attached by the margin, reniform, about 7-lobed, shining; lobes roundish, crenated: umbels capitate, 6–8-flowered, sessile: fruit minute, orbicular, prominently 3-ribbed on each side, smooth and flat between the ribs.—*Don, prod. fl. Nep. p.* 183; *DC. prod.* 4. *p.* 64; *Wight! cat. n.* 1186.—H. Wightiana, *Wall.! L. n.* 7220.

1132. (3) H. *polycephala* (W. & A.:) stems rooting, scabrous or nearly glabrous; branches petioles and peduncles, and the leaves sparingly on both sides, scabrous from short stout hairs: leaves attached by the margin, orbicular-reniform, 7-lobed; lobes scarcely acute, coarsely crenated: peduncles hoary, numerous (6–18) and umbellate in the axil of the uppermost shortly petioled leaf, almost as long as the leaf: flowers all fertile, numerous (20–30 together), at first capitate and almost sessile, afterwards (in fruit) on short glabrous somewhat permanent pedicels: fruit didymous, slightly 2-ribbed on each side, smooth and flat between the ribs.—*Wight! cat. n.* 1187.

Closely allied in many points to *H. Nepalensis*. We had almost considered this to be *H. Heyneana* of Wallich, but De Candolle's character is too much at variance to permit of our uniting them.

1133. H. *Zeylanica* (DC.:) stems puberulous: leaves attached by the margin, glabrous, orbicular reniform, 7-nerved, 7-lobed; lobes slightly acute, coarsely crenated: petioles long, puberulous at the apex: peduncles puberulous, the ultimate ones by the disappearance of the leaf apparently opposite and racemosely umbellate: umbels densely capitate, 20-flowered.—β; *Heyneana*, peduncles bearing at the apex 8–10 umbels arranged in an umbel; pedicels retrorsely hispid.—*D.C. prod.* 4. *p.* 67.—H. Heyneana, *Wall. L. n.* 563.

Our character is taken from De Candolle: we have not seen either variety; probably in the var. β, it is the peduncles and not the pedicels that are hispid; and the ultimate branches, not the peduncles, that bear the umbels of heads.

Digitized by Google

TRIBE 2.—SANICULEÆ, *Koch.; DC.*

Fruit, when cut transversely, somewhat terete. Mericarps with 5 equal primary and no secondary ridges, or covered with scales or prickles the ridges being obliterated. Vittæ none, or numerous when the fruit is prickly. Seed, when cut transversely, flattish in front.—Umbels fascicled or capitate, simple or irregularly somewhat compound.

II. SANICULA. *Tourn.; Linn.; Lam. ill. t.* 191; *Gærtn. fr. t.* 20.

Calyx-tube echinate: its lobes slightly leafy, persistent. Petals erect, connivent, obovate, with long inflected points. Fruit somewhat globose, terete, not dividing spontaneously. Mericarps densely clothed with hooked prickles, without ridges, with many vittæ. Carpophore indistinct. Seeds semiglobose. —Herbaceous perennial plants. Radicle leaves petioled, palmately lobed, the lobes cuneate, incise and toothed towards the apex. Stem naked or sparingly leafy. General umbel with few rays; leaflets of the involucre few and often lobed: partial one of several rays; the leaflets of the involucel several and entire. Flowers in the same umbel, male, female, or bisexual.

1134. (1) S. *elata* (Ham.:) stem dichotomous at the apex: leaves 3-partite or ternate, glabrous; segments sessile, ovate, acute, lobed and serrated, cuneate at the base, the lateral ones often bipartite: umbels usually 3-fid, few-flowered: flowers polygamous, the males pedicelled.—*Don, prod. fl. Nep. p.* 183; *DC. prod.* 4. *p.* 85; *Spr. syst. suppl. p.* 116; *Wall.! L. n.* 559; *Wight! cat. n.* 1188.—S. hermaphrodita, *Don? l. c.; Spr.? l. c.*

TRIBE III. AMMINEÆ. *Koch.; DC.*

Fruit evidently compressed laterally, and usually somewhat didymous. Mericarps with 5 equal filiform and sometimes slightly winged primary ridges; the lateral ones on the margin: secondary ridges wanting. Vittæ various. Seed gibbously convex on the back and flattish in front, or terete.—Umbels perfectly compound.

III. APIUM. *Linn.; Hoffm.; DC.; Gærtn. fr.* 1. *t.* 22.

Margin of the calyx obsolete. Petals roundish, entire, with a small inflexed or involute point. Stylopodium depressed. Fruit roundish, laterally contracted, didymous. Mericaps with 5 equal filiform ridges, of which the lateral ones are marginal. Interstices with single vittæ, outer ones frequently with 2–3 vittæ. Carpophore entire. Seed gibbously convex, flat in front. —Herbaceous. Stem furrowed, branched. Leaves pinnated, segments cuneiform, cut. Umbels nearly sessile on axillary branchlets or at the apex of the stem. Involucre and involucel wanting. Flowers greenish-white.

1135. (1) A. *graveolens* (Linn.:) glabrous: leaves pinnated; upper ones ternate; segments cuneate, incise and toothed at the apex: petals with the point closely involute.—*DC. prod.* 4. *p.* 101; *Spr. syst.* 1. *p.* 890; *Wall.! L. n.* 7212; *Wight! cat. n.* 1189.—Apium Celeri, *Gærtn. fr.* 1. *t.* 22.

IV. HELOSCIADIUM. *Koch.; DC.*

Margin of the calyx obsolete, or 5-toothed. Petals ovate, entire, with a straight or inflexed point. Styles short. Fruit laterally compressed, ovate or oblong. Mericarps with 5 filiform equal slightly prominent ridges, of which the lateral ones are marginal. Interstices with single vittæ. Carpophore entire, free. Seed gibbously or teretely convex, flattish in front.—Herbaceous. Umbels compound. Flowers white.

Digitized by Google

1136. (1) H. *Heyneanum* (DC.:) annual, glabrous: stem erect, slightly branched: leaves long-petioled, ternate; segments shortly petioled, lanceolate, acuminated, or tripartite, toothed: umbels long-peduncled, without involucre or involucels; the rays 5–20, elongated; partial umbels 5–8-flowered: fruit orbicular, somewhat didymous, glabrous.—*DC. prod.* 4. *p.* 106; *Wight! cat. n.* 1190.—Pimpinella Heyneana, *Wall.! L. n.* 566.—Apium trifoliatum, *Roxb. fl. Ind.* 2. *p.* 96.—Seseli Zeylanicum, *herb. Madr.!*——Circars; *Roxburgh.* Courtallum; *Klein.* Mysore; *Heyne.*

We have it also from Ceylon. Perhaps we ought to have restored the specific appellation given by Roxburgh; and we have only been prevented from doing so by there being already an *H. trifoliatum* in De Candolle's prodromus, founded on *Pimp. trifoliata,* Wall. L. n. 565.

V. PTYCHOTIS. *Koch; DC.*

Margin of the calyx 5-toothed. Petals obovate, bifid or emarginate, with a long inflexed point proceeding from the sinus, and cohering with the middle vein. Fruit compressed, ovate or oblong. Mericarps with 5 equal filiform primary ridges, the lateral ones marginal. Interstices with single vittæ. Carpophore bipartite. Seed terete or gibbously convex, flattish in front. —Annual or biennial plants. Cauline leaves usually cut into numerous capillary segments. Umbels compound: involucre wanting or few-leaved; involucel of several leaves. Flowers white.

De Candolle supposes that the petals have a transverse plait, from the middle of which, and not from the apex of the petal, the small appendage or adnate portion is produced: this is certainly not the case in any species we have examined; nor, indeed, is there any essential difference between the structure of the petals in this genus and in many others of the order. The inflexed and adnate point appears to us to proceed from the sinus; or rather, we may say, it is by the petal being extremely introflexed, that the deep sinus is formed. By its adhering to and contracting the middle vein, the lower half of the petal is concave, while the two lobes on each side of the sinus are flat or slightly recurved; and it is the boundary between the concave and flat portion, which we presume has been mistaken for a plait.

1137. (1) P. *Ajowan* (DC.:) stem erect, dichotomous: leaves few, cut into numerous linear or filiform segments; the uppermost simply pinnate: umbel with 7–9 rays: involucre few-leaved; leaflets linear, entire: fruit strongly ribbed, covered with small blunt tubercles.—*DC. prod.* 4. *p.* 109; *Wight! cat. n.* 1191.—Ligusticum Ajowan, *Flem.; Roxb. fl. Ind.* 2. *p.* 91; *in E. I. C. mus. tab.* 1042.—Athamantha Adjowan, *Wall. L. n.* 572.

VI. PINPINELLA. *Linn.; Koch.; DC.*

Margin of the calyx obsolete. Petals obovate, emarginate, with the point long and inflexed. Fruit contracted laterally, ovate. Stylopodium cushion-shaped. Styles generally reflexed, sometimes straight, somewhat capitate at the apex. Mericarps with 5 equal filiform ridges, the lateral ones marginal. Interstices with many vittæ. Carpophore bifid. Seed gibbous-convex, flattish in front.—Herbaceous plants with simple roots. Radical leaves either pinnated with the segments usually roundish and toothed, or rarely again pinnated, or entire: stem leaves more finely divided. Umbels general and partial with many rays, without involucres or involucels, or very rarely with them. Petals white, more rarely reddish or yellow.

P. diversifolia, DC., or *Heracleum diversifolium*, Wall. L. n. 574, is, according to specimens from Dr Wallich, a true species of *Heracleum*, belonging to De Candolle's 6th section, and not apparently distinct from *H. Wallichii*, DC.

Digitized by Google

§ 1. *Involucre and involucel few-leaved.*

* 1138. (1) P.? *involucrata* (W. & A.:) stem erect, dichotomous, glaucous: leaves ternate; segments cut and pinnated, or sometimes entire in the upper leaves; lobes in the lower leaves linear-oblong and short, in the upper oblong-linear and elongated: umbels with 6–8 rays; leaflets of the involucre and involucel few (about 6), subulate, entire, much shorter than the rays: styles reflexed: fruit slightly ribbed, minutely muricated all over.—*Wight! cat. n.* 1192, 1193.—Apium involucratum, *Roxb. fl. Ind.* 2. *p.* 97; *in E. I. C. mus. tub.* 1388.—Athamantha Roxburghiana, *Wall.! L. n.* 571.—Ptychotis Roxburghiana, *DC. prod.* 4. *p.* 109.—Phellandrium, *Wall.! L. n.* 7217.

Although we have only seen letter *d*, at p. 248 of Wall. L. n. 571, we have every reason to believe it the same with the others: and on that supposition we have referred to De Candolle; but we can scarcely account for his overlooking the numerous vittæ in the interstices, unless indeed his specimens may not have presented sufficiently advanced fruit, and he had arranged the species along with *Pt. Ajowan* on account of the muricated mericarps. It must be allowed to be a dubious species of *Pimpinella*, on account of the presence of an involucre: but we cannot find characters to separate it generically, unless they are to be found in the carpophore, which our specimens were not sufficiently advanced to exhibit.

1139. (2) P. *Candolleana* (W. & A.:) perennial?: stem erect, slightly branched, and the petioles densely pubescent or shortly villous: leaves very pubescent on both sides, hard and firm, cartilaginously toothed; radical and lower cauline ones reniform-cordate, entire; middle cauline ones tripartite, the segments cut and sometimes lobed; upper ones small and divided down to the sheath: umbels with many (10–16) very pubescent rays: leaves of the involucre 5–8, subulate, deciduous, much shorter than the rays; of the involucel somewhat permanent, about the length of the rays: styles at length reflexed: fruit densely covered with small granular tubercles.—*Wight! cat. n.* 1194.——Mountains in the south of the Peninsula.

P. Javana, DC., seems very closely allied to this species, but De Candolle describes its fruit hirsutely hispid, and the involucre with only one leaf. The carpophore in this and the next appears at first sight entire, although a more careful examination shows it to be split.

§ 2. *Involucre and involucel wanting.*—Eupimpinella.

1140. (3) P. *Leschenaultii* (DC.:) biennial?: stem slightly branched, glabrous or minutely pubescent: radical leaves petioled, orbicular, cordate, entire, toothed, firm and hard, many-nerved at the base, glabrous on the upper side, pubescent on the under; cauline ones few, divided, small and almost reduced to the sheathes: umbel with 5–10 pubescent rays; partial ones with many rays: involucres and involucels wanting: styles diverging: fruit ovate-acuminated, glabrous.—*DC. prod.* 4. *p.* 122; *Wight! cat. n.* 1195.——Neelgherries.

VII. BUPLEURUM. *Tourn.; Linn.; DC.*

Margin of the calyx obsolete. Petals roundish, entire, with the closely involute point broad and retuse. Fruit laterally compressed or somewhat didymous, crowned with the depressed stylopodium. Ridges of the mericarps 5, equal, either winged, sharp, filiform, or obsolete: the lateral ones marginal. Interstices with or without vittæ, smooth or granulated. Seed teretely convex, flattish in front.—Herbaceous or shrubby glabrous plants. Leaves rarely divided, usually from the abortion of the limb and dilatation of the petiole changed into phyllodia with quite entire margins. Umbels compound. Involucres various. Flowers yellow.

Digitized by Google

1141. (1) B. *distichophyllum* (W. & A.:) perennial: stems erect, simple and twiggy below, flexuose and almost simply branched upwards: leaves distichous and usually crowded near the base of the stem, more distant upwards, somewhat erect, from narrow-linear and much acuminated to linear-subulate, very sharp, amplexicaul, striated on the under side: general umbel with 5–8 rays; partial with 10–13 flowers: leaflets of the involucre and involucel about 5 or 6, linear acuminated and very sharp; the former about twice as short as the rays, the latter usually longer than the fruit: fruit prominently ribbed, rather shorter than the pedicels; interstices flattish, with single vittæ.—*Wight! cat. n.* 1196.

* 1142. (2) B. *virgatum* (W. & A.:) perennial: stems ascending, twiggy, simple or nearly so below, with a few flower-bearing almost leafless short branches towards the top: leaves linear, shortly but very sharply pointed, few-nerved, lower ones long and narrow, upper broader and shorter: general umbels with 4 rays; partial with 5–6 flowers: leaflets of the involucre and involucel oblong-linear, pointed; the former 3–4, 3–4 times shorter than the rays; the latter 4–6, about the length of the flowers, shorter than the fruit: fruit about 3 times longer than the pedicels, strongly ribbed; interstices striated, with 3 vittæ.

Our specimens are from Ceylon, but we insert it here, as it is probably likewise a native of the southern mountainous districts of the Peninsula. In habit it approaches closely to *B. tenue*, Don, and *B. longicaule*, Wall.

1143. (3) B. *mucronatum* (W. & A.:) perennial: stems from a horizontal woody shoot, erect, slightly branched or simple below, flexuose upwards with short and almost simple branches: leaves linear, bluntish with a long mucro, somewhat coriaceous, pellucid on the margin, amplexicaul, 5–9-nerved: general umbel with 5–6 rays; partial one with 6–12 flowers: leaflets of the involucre and involucel linear-oblong, mucronate; the former 2–3 times shorter than the rays, the latter longer than the flowers and shorter than the fruit: fruit sharply ribbed, twice as long as the pedicels; interstices flattish with single vittæ.—*Wight! cat. n.* 1197.

1144. (4) B. *ramosissimum* (W. & A.:) perennial, diffuse and much branched: leaves oblong-linear, with a long mucro, narrowed towards the base, amplexicaul, 5–9 nerved, between coriaceous and membranaceous: general umbels with 5–8 rays; partial with 8–12 flowers: leaflets of the involucre and involucel about 5, oblong-linear, mucronate; the former 2–3 times shorter than the rays; the latter rather longer than the flowers, shorter than the fruit: fruit about a half longer than the pedicels, strongly ribbed; interstices with 1–2 vittæ.—*Wight! cat. n.* 1198.

TRIBE IV.—SESELINEÆ. *Koch.*

Fruit, when cut transversely, terete or nearly so. Mericarps with 5 filiform or winged ridges, of which the lateral ones are marginal, and either equal with or a little broader than the others. Interstices with 1 or more vittæ, very rarely without any. Seed somewhat teretely convex on the back, flattish in front. Raphe marginal or nearly so. Umbels perfectly compound.

VIII. FŒNICULUM. *Adans.; DC.; Gærtn. fr.* 1. *t.* 23.

Margin of the calyx tumid, obsolete, and without teeth. Petals roundish, entire, involute, the involute portion somewhat square and retuse. Fruit somewhat terete. Mericarps with 5 prominent bluntly keeled ridges, of which the lateral ones are marginal and a little broader than the others. Interstices with single vittæ. Commissura with 2 vittæ. Seed nearly semiterete.—Herbaceous annual, biennial or perennial plants. Stems terete, ob-

Digitized by Google

scurely striated, branched. Leaves pinnated, decompound; the segments linear-setaceous. Involucre and involucel entirely or almost wanting. Flowers yellow.

* 1145. (1) F. *vulgare* (Gærtn.:) biennial: stem terete at the base: segments of the leaves linear-filiform, elongated: umbels with 13–20 rays: involucre wanting.—*Gærtn. fr.* 1. *p.* 105. *t.* 23; *DC. prod.* 4. *p.* 142; *Wight! cat. n.* 1199.—F. officinale, *Allioni.*—Anethum Fœniculum, *Linn.*—Meum Fœniculum, *Spr. syst.* 1. *p.* 891.

From this *F. Panmorium*, DC., or *Anethum Panmori*, Roxb. (fl. Ind. 2. p. 94, and in E. I. C. mus. tab. 1387) appears scarcely to differ; it is annual and only of a few months' duration; its leaves are at all times scattered over the stem, and they are fewer and more remote than in *F. vulgare*; this last does "not blossom till the second year, during which period the leaves are bifarious, infinitely larger and more divided than in" *F. Panmorium.*—Roxb.

IX. SESELI. *Linn.; DC.*

Margin of the calyx 5-toothed; the teeth short, thickish, and sometimes obliterated. Petals obovate, emarginate or entire, with an inflexed point. Fruit ovate, oval, or oblong, somewhat terete, crowned with the reflexed styles. Mericarps with 5 prominent and filiform, or elevated thick and corky ridges; the lateral ones marginal and often a little broader than the others. Interstices with single vittæ, the outer ones rarely with 2 vittæ. Commissura with 2 or rarely 4 vittæ. Seed nearly semiterete.—Herbaceous biennial or perennial plants. Leaves pinnated or ternately decompound. Involucre usually of few, rarely of many leaves, or wanting. Involucel several-leaved. Flowers white, very rarely yellow.

1146. (1) S. *Indicum* (W. & A.:) diffuse, branched, all over slightly villous: stems furrowed: leaves pinnated; segments roundish, entire or lobed or pinnatifid, cut and toothed: general umbels on longish peduncles, with about 12 rays; partial ones many flowered: leaves of the involucre and involucel many (about 8 or 10), lanceolate, with a subulate point, membranaceous on the margins, hairy: fruit somewhat globose, covered all over but particularly on the ridges with spreading straight hairs furnished with 2 divaricating or reflexed points; ridges elevated, corky: vittæ single in the interstices and under each ridge!—*Wight! cat. n.* 1200.—Ligusticum Indicum, *Klein.! in Wall.! L. n.* 7215.

Probably this may form a separate genus on account of there being vittæ not only in the interstices but also under the ridges.

TRIBE V.—PEUCEDANEÆ. *DC.*

Fruit more or less compressed dorsally, surrounded by a single dilated smooth winged flattened or slightly convex (but not thickened at the edge) entire margin. Mericarps with 5 filiform or more rarely winged ridges, of which the lateral ones are contiguous to the dilated margin or passing into it. Raphe marginal. Seed flattened or convex on the back.—Umbels perfectly compound.

X. ANETHUM. *Tourn.; Gærtn. fr.* 1. *t.* 21; *DC.*

Margin of the calyx obsolete. Petals roundish, entire, involute, with the involute portion somewhat square and retuse. Fruit lenticularly compressed on the back, surrounded by a flattened margin. Mericarps with 5 equidistant filiform ridges, the dorsal and 2 intermediate ones acutely keeled, the lateral ones more obsolete and passing into the margin. Vittæ broad, solita-

Digitized by Google

ry in and filling up the whole of each interstice, 2 on the commissura. Seed slightly convex, flat in front.—Annual, erect, glabrous plants. Leaves decompound: lobes linear, setaceous. Involucres and involucels wanting. Flowers yellow.

1147. (1) A. *Sowa* (Roxb.:) fruit oblong, almost destitute of a membranaceous margin.—*Roxb. fl. Ind.* 2. *p.* 96; *in E. I. C. mus. tab.* 1046; *Wall. L. n.* 595; *Wight! cat. n.* 1201.—A. graveolens, *herb. Madr.!*; *Wall.! L. n.* 7210.

XI. PASTINACA. *Tourn.; Linn.; DC.*

Margin of the calyx obsolete or minutely toothed. Petals roundish, entire, involute, the involute part broad and retuse. Fruit flat-compressed dorsally, surrounded by a dilated flattened margin. Mericarps with very slender ridges; the dorsal and 2 intermediate ones equidistant, the lateral contiguous to the dilated margin. Vittæ linear, scarcely shorter than the ridges, solitary in each interstice, 2 or more on the commissura. Carpophore bipartite. Seed flattened.—Herbaceous plants with a fusiform and often fleshy root. Leaves pinnated, the segments toothed, cut or lobed. Umbel compound. Involucre and involucel wanting or few-leaved. Flowers usually yellow.

1148. (1) P. *Candolleana* (W. & A.:) stem striated or slightly furrowed, glabrous below, pubescent below the umbels and on the rays: leaves pubescent; ultimate divisions pinnatifid or lobed, their segments oblong acuminated and sharply serrated: leaflets of the involucre and involucel deciduous, linear-oblong: margin of the calyx toothed: fruit oblong, glabrous; lateral vittæ close to the intermediate ridges; commissura with 2 vittæ.—*Wight! cat. n.* 1202.

The flowers appear white.

1149. (2) P. *ligusticifolia* (W. & A.:) stem slightly striated or almost even, glabrous below, pubescent at the apex and on the rays: leaves glabrous; ultimate divisions pinnatifid or lobed; their segments ovate, acute, serrated: leaflets of the involucre and involucel linear-oblong, acuminated, deciduous: margin of the calyx inconspicuously toothed: fruit oval, very glabrous, polished; lateral vittæ close to the intermediate ridges; commissura with 2 vittæ.—*Wight! cat. n.* 1203.

Our specimens of both these species are imperfect: they are no doubt closely allied, but appear distinct.

XII. HERACLEUM. *Linn.; Lam. ill. t.* 200; *DC.*

Calyx 5-toothed. Petals obovate, emarginate, with the point inflexed; the exterior ones often larger, spreading and bifid. Fruit dorsally flat-compressed, surrounded by a dilated flattened margin. Mericarps with very slender ridges, the dorsal and intermediate ones equidistant; the two lateral ones remote and contiguous to the dilated margin. Vittæ solitary in the interstices, or rarely in pairs in the lateral ones, usually 2 but sometimes 4 or none on the commissura, all shorter than the fruit and usually club-shaped. Carpophore bipartite. Seed flattened.—Herbaceous and usually large plants. Leaves pinnated, ternate, or lobed: petioles amply sheathing. Umbels with many rays. Involucre deciduous, usually few-leaved. Involucel many-leaved.

1150. (1) H. *Sprengelianum* (W. & A.:) stem branched, furrowed, harshly puberulous towards the top: petals equal: fruit nearly orbicular; vittæ on the back linear, acute, a little shorter than the fruit, the lateral ones in

Digitized by Google

the middle of the interstices; vittæ on the commissura 4, slightly clavate and unequal.—*Wight! cat. n.* 1204.

Of this we have not seen the leaves.

1151. (2) H. *rigens* (Wall.:) stem slightly branched, furrowed, pubescent or hirsute: leaves ternate; divisions roundish, somewhat cordate at the base, toothed, upper side more or less scabrous with short hairs, under densely pubescent or tomentose, lateral ones on a short, terminal one on a long petiole, the latter bluntly 3-lobed or ternate: leaflets of the involucel ovate: petals equal: fruit obovate; vittæ on the back linear, much shorter than the fruit, the lateral ones in pairs, and close to the intermediate ridges; vittæ on the commissura 4, acute, unequal, the two outer the shorter.—*Wall.! L. n.* 575; *DC. prod.* 4. *p.* 191; *Wight! cat. n.* 1205 *and* 1206 (deformed specimen.)—Conium Siva, *herb. Madr.!*—Dindygul hills. Mysore.

1152. (3) H. *Hookerianum* (W. & A.:) stem nearly simple, furrowed, coarsely pubescent or somewhat hirsute with short glutinous hairs: leaves nearly radical, 3-lobed, toothed, sparingly pubescent or hairy on the upper side, shortly tomentose on the under; lobes roundish, toothed, the terminal one the largest and often 3-lobed; upper stem-leaves few, and sometimes almost reduced to the mere sheathes: umbels long-peduncled, with 6–10 rays: leaflets of the involucre persistent during flowering, afterwards deciduous, lanceolate-subulate; of the involucel oblong lanceolate, longer than the flowers: petals (whitish with a tinge of red) unequal: fruit (very immature) sprinkled with a few short hairs; commissura with 2 vittæ.—*Wight! cat. n.* 1207.

Mountains in the south of the Peninsula.

TRIBE VI.—CUMINEÆ. *Koch.*

Fruit laterally contracted. Mericarps with 5 primary filiform ridges of which the lateral ones are marginal, and 4 secondary ones more prominent than the others, all of them wingless. Seed straight, flattish in front.—Umbels compound.

XIII. CUMINUM. *Linn.; Gærtn. fr.* 1. *t.* 23; *DC.*

Calyx-teeth 5, lanceolate or setaceous, unequal, persistent. Petals between erect and spreading, oblong, emarginate, with the point inflexed. Fruit laterally contracted. Mericarps with the ridges wingless, the 5 primary ones filiform and minutely muricated, the lateral ones marginal, the 4 secondary ones more prominent and prickly. Interstices with single vittæ under the secondary ridges. Carpophore bipartite. Seed slightly concave in front, convex on the back.—Herbaceous plants. Leaves multifid, the lobes linear-setaceous. Involucre of 2–4 simple or divided leaflets; involucel dimidiate, 2–4-leaved, at length reflexed. Flowers white or reddish.

*1153. (1) C. *Cyminum* (Linn.:) lobes of the leaves linear-setaceous, acute: umbel with 3–5 rays: involucel longer than the usually pubescent fruit.—*DC. prod.* 4. *p.* 201; *Spr. syst.* 1. *p.* 905; *Roxb. fl. Ind.* 2. *p.* 92; *Wall. L. n.* 594.

We consider this a very doubtful native of India.

TRIBE VII.—DAUCINEÆ. *Koch.*

Fruit lenticularly compressed at the back, or somewhat terete. Mericarps with 5 filiform bristly primary ridges, of which the lateral ones are placed on the flat commissura, and 4 more prominent prickly secondary ones, the prickles being either distinct or united into a wing. Seed flattened or convex on the back, flattish in front.—Umbels compound.

Digitized by Google

XIV. DAUCUS. *Tourn.; Linn.; Gærtn. fr.* 1. *t.* 20; *DC.*

Margin of the calyx 5-toothed. Petals obovate, emarginate, with the point inflexed, the outer ones often larger than the others and deeply bifid. Fruit somewhat compressed dorsally, ovate or oblong. Mericarps with 5 filiform and bristly primary ridges, of which 3 are on the back, and 2 on the flat commissura; the 4 secondary ridges equal, more prominent, with one row of prickles which are slightly connected at the base. Interstices with single vittæ under the secondary ridges. Seed flattish in front.—Herbaceous often biennial plants. Leaves bi-tri-pinnated. Involucre of several trifid or pinnatifid leaflets: involucel also of several, either entire or trifid. Flowers white or yellow, the central one often fleshy and sterile.

*1154. (1) D. *Carota* (Linn.:) stem hispid; leaves twice or thrice pinnated; divisions pinnatifid; the lobes lanceolate, cuspidate: leaflets of the involucre pinnated, about the length of the umbel; the divisions subulate-setaceous: umbels with a solitary coloured abortive central flower, concave when in seed: the prickles slender, and about equal to the diameter of the oblong-oval fruit.—*DC. prod.* 4. *p.* 211; *Spr. syst.* 1. *p.* 897; *Roxb. fl. Ind.* 2. *p.* 90; *Wall. L. n.* 7214; *Wight! cat. n.* 1208.

This has probably escaped from gardens.

TRIBE VIII.—CAUCALINEÆ. *Koch.*

Fruit laterally contracted or somewhat terete. Mericarps with 5 primary filiform bristly or prickly ridges, of which the lateral ones are on the flat commissura; and 4 more prominent and prickly secondary ones that are sometimes obliterated from the abundance of prickles covering the whole interstices. Seed involute or with the margin inflexed.—Umbels compound.

XV. TORILIS. *Spr.; DC.*

Calyx-teeth 5, triangular-lanceolate, acute, persistent. Petals obovate, emarginate with the point inflexed, the outer ones larger and bifid. Fruit contracted laterally. Mericarps with 5 primary bristly ridges, of which 3 are on the back, and 2 on the flat commissura: the secondary ridges obliterated from the numerous prickles that fill the interstices. Interstices with single vittæ beneath the prickles. Carpophore setaceous, bifid. Seed with the margin inflexed.—Herbaceous plants with multifid leaves. Hairs short, adpressed and pointing downwards on the stem, erect on the rays of the umbel. Umbels terminal or leaf-opposed. Involucre 1–8-leaved: involucel of 5–8-lanceolate, ciliated leaflets. Flowers white, those of the disk male and sterile. Prickles of the fruit slender, hair-like, often hooked at the apex.

1155. (1) T. *Anthriscus* (Gmel.:) hispid, erect, branched: leaves bipinnated; divisions lanceolate, incise-serrated, attenuated: umbels long-peduncled, terminal, with 5–7 rays: leaflets of the involucre 4–5, linear-subulate: prickles close, rigid, incurved and simple at the apex, about twice shorter than the breadth of the fruit.—*Spr. syst.* 1. *p.* 898; *DC. prod.* 4. *p.* 218; *Wight! cat. n.* 1209.—Caucalis Anthriscus, *Scop; Don, prod. fl. Nep. p.* 183. —C. elata, *Wall.! L. n.* 564. *b. (p.* 248.)—Tordylium Anthriscus, *Linn.*

Our specimens of *T. elata*, DC., or *Cauc. elata*, Don. (Wall. L. n. 564. *a.* 1. and 2.) are too imperfect to admit of our ascertaining whether or not it be also referable to this species: the habit is precisely the same and the leaves being more divided and the leaflets of the involucel a little more numerous

Digitized by Google

(5–8), are characters too dependent on local circumstances to be of the least value. Don, however, states that the prickles on the fruit are straight, which is more worthy of attention, but then De Candolle places it in the section with the prickles incurved. Perhaps as Dr Wallich found both in Nepal, they are mixed together under the same number.

TRIBE IX.—SCANDICINEÆ. *Koch.*

Fruit evidently compressed or contracted laterally, usually beaked. Mericarps with 5 filiform or winged ridges, of which the lateral ones are marginal, all of them equal and sometimes obliterated at the base, and only conspicuous at the apex. Seed teretely convex, either deeply furrowed in front or with the margin involute.—Umbels compound.

XVI. OZODIA. *W. & A.*

Margin of the calyx almost obsolete. Petals roundish, emarginate, involute, the involute portion somewhat square and retuse. Styles short, conical, diverging, persistent, rigid. Fruit oblong, laterally compressed, without a beak. Mericarps with 5 primary filiform scarcely prominent ridges, of which the lateral are marginal, with a furrow along the commissura. Vittæ solitary in the flattish interstices, two on the commissura. Seed teretely convex on the back, furrowed in front, with a simple seed-coat.—Glabrous glaucous plants with the habit of *Fœniculum*. Stem striated. Leaves multifid, with the lobes linear-setaceous. Umbels with 12–20 rays. Involucre and involucel wanting. Petals yellowish.

This genus appears very closely allied to *Grammosciadium* of De Candolle.

1156. (1) O. *fœniculacea* (W. & A.)—*Wight! cat. n.* 1210.

Sent to Dr Wight by his collectors under the name of *Paroon-seragum*. We cannot refer any described plant to it; at one time we suspected that it might be *Anethum Panmori* of Roxburgh, but Roxburgh's drawing does not represent the fruit or seed of the present genus.

ORDER LXXVIII. ARALIACEÆ. *Juss.*

Calyx entire or toothed. Petals 5–16, alternate with the teeth of the calyx, very rarely wanting and then (in *Adoxa*) perhaps changed into supplementary stamens: æstivation valvate. Stamens as many as the petals, rarely twice as many, inserted below the margin of a large epigynous disc: anthers 2-celled. Ovarium cohering with the tube of the calyx, of two or more cells, or very rarely of one cell: ovules solitary, pendulous: styles as many as the cells of the ovary, distinct, concrete, or rarely wanting: stigmas simple. Fruit usually fleshy, 2–15-celled, or very rarely with only 1 cell, crowned with the limb of the calyx: endocarp crustaceous. Seeds solitary, pendulous. Embryo small, surrounded with a copious fleshy albumen, close to the hilum: radicle pointing to the hilum, superior.—Trees, shrubs, or herbaceous plants. Leaves alternate, exstipulate. Flowers umbelled or capitate.

Besides the following, we have also a plant (*Araliacea? Kleinii*, Wight's cat. n. 1211) with the habit somewhat of this order; but whether it actually belong to it we have not materials sufficient to enable us to decide. The following description may

Digitized by Google

however enable it to be again recognised.—Flowers unisexual. *Male.* Perianth simple, 4-partite; segments linear-elliptical, coriaceous, valvular in æstivation. Stamens 4, alternate with the divisions of the perianth: filaments very short, broadest at the base: anthers fixed by their back a little above the base, nearly as long as the perianth, dehiscing longitudinally. No rudiment of a pistillum. *Female* unknown. Stem twining, glabrous as well as the whole plant. Leaves alternate, oval, shortly acuminated, with a few teeth or short sharp lobes near the base, scarcely coriaceous, feather-nerved; nerves rather distant, about 5 on each side of the midrib. Petioles twining. Peduncles several (3–5) together, filiform, pretty long, springing from tubercles at the apex of very short abortive supra-axillary branchlets (or general peduncles?), each bearing a simple many-flowered umbel. Pedicels slender, surrounded at the base by a minute cup-shaped 4-cleft ciliated bractea resembling a little calyx.—Our specimens were obtained from Klein's herbarium; there was no name or locality attached. If this be truly Araliaceous, we may suppose the flowers to be polygamous, and the calyx in the male flower to be quite abortive, while the petals are what we term the segments of the perianth.

I. PANAX. *Linn.; Lam. ill. t.* 860.

Flowers polygamous. Margin of the calyx very short; obsoletely 5-toothed. Petals 5. Stamens as numerous as the petals, alternating and inserted with them. Styles 2–3, short. Fruit fleshy, compressed, orbicular or didymous, 2–3-celled; cells coriaceously chartaceous.——Trees, shrubs, or herbaceous plants.

P. anisum, DC. is a species of *Zanthoxylum*.

*1157. (1) P. *fruticosum* (Linn.:) shrubby, unarmed: leaves pinnately decompound; leaflets petioled, oval-oblong, acuminated, very acutely serrated, often variously laciniated: panicle corymbose, the branchlets bearing umbels at the apex: styles 2–3: ovary and berry 2–3-lobed and celled.—*DC. prod.* 4. *p.* 254; *Spr. syst.* 1. *p.* 867; *Roxb. fl. Ind.* 2. *p.* 76; *in E. I. C. mus. tab.* 1389; *Wall.! L. n.* 4932; *Wight! cat. n.* 1212.—*Rumph. Amb.* 4. *t.* 33.

Our specimens were obtained from the Madras herbarium, and are probably cultivated.

†1158. (2) P. *Heyneana* (Wall.)—*Wall. L. n.* 4927.

II. HEDERA. *Linn.; Swartz; Gærtn. fr.* 1. *t.* 26.

Margin of the calyx elevated or toothed. Petals 5–10, distinct, or cohering at the apex and falling off like a calyptra. Stamens 5–10. Styles as many as the petals rarely only 4, converging or combined into 1. Berry with as many cells as there are styles.—Climbing or erect shrubs, or trees. Leaves simple or compound. Flowers umbelled or capitate.

It is probable that several species of *Sciodaphyllum* belong to this genus, while the remainder may be transferred to *Aralia*. *Torricellia* of De Candolle does not appear to differ, and the Asiatic and Mauritius species of *Gilibertia* may likewise be united. *Gilibertia Nalugu*, DC., however, or *Gastonia Nalugu* of Lamarck and of Sprengel, is our *Leea staphylea*, &c. We may further remark, that *Aralia palmata* is certainly a species of *Hedera*, near *H. jatrophifolia*, DC., and is perhaps *H. cheiranthа*, Wall. L. n. 4925: *A. octophylla* belongs to *Paratropia*: *A. chinensis* of Loureiro (not of Linnæus) is a species of *Zanthoxylum*.

1159. (1) H. *latifolia* (W. & A.:) glabrous: leaves pinnately 3-foliolate; leaflets roundish, slightly cordate at the base, retuse, minutely and distantly serrated, slightly coriaceous, without prominent veins, petioled, the terminal petiole nearly twice as long as the others: panicle long, slender, narrow, consisting of a few distant fascicles of peduncles bracteated at their base; rachis compressed: flowers 3–5 together, umbelled: calyx 5-toothed: corolla calyptra-shaped: stamens 5: styles 4: ovary 4-celled.—*Wight! cat. n.* 1213.

Digitized by Google

1160. (2) H. *trifoliata* (W. & A.:) shrubby, unarmed, glabrous: leaves pinnately trifoliolate; leaflets ovate with a narrow acumination, equal and slightly acute at the base, somewhat closely bristle-serrated, scarcely coriaceous, petioled; terminal petiole 4–5 times longer than the others: panicle corymbiform, bracteated; flowers umbellate, numerous in each umbel: calyx 5-toothed: corolla calyptriform, ovoid: stamens 5: styles united into one: berry 5-celled.—*Wight! cat. n.* 1214.——Dindygul hills?

Closely allied to the following, but in all our specimens of both the characters given are constant.

1161. (3) H. *Leschenaultii* (W. & A.:) shrubby, unarmed, glabrous: leaves pinnated; leaflets 2 pair with an odd one, ovate with a narrow acumination, retuse or slightly cordate at the base, lower pair and terminal one equal at the base, the upper pair unequal, all scarcely coriaceous, somewhat closely bristle-serrated, petioled; terminal petiole 4–6-times longer than the contiguous lateral ones, about twice as long as the lower ones: panicle corymbiform, bracteated; flowers umbellate, numerous in each umbel: calyx 5-toothed: corolla calyptra-shaped, hemispherical: stamens 5: styles united into 1: berry hemispherical, 5-celled.—*Wight! cat. n.* 1215.—Panax Leschenaultii, *DC.? prod.* 4. *p.* 254.——Neelgherries. Dindygul hills.

Our only doubt as to this being De Candolle's plant arises from his not describing the base of the leaflets as cordate or retuse.

1162. (4) H. *ovata* (Wall.)—*Wall. L. n.* 4911.

This is perhaps the same as n. 1211 of Wight's Catalogue, which we have described under the character of the order.

III. PARATROPIA. *DC.*—Heptapleurum, *Gærtn. fr.* 2. *t.* 178. *f.* 1.

Calyx truncated, with scarcely any margin. Petals 5–9, distinct. Stamens as many as the petals. Styles wanting. Stigmas 5–9, sessile and immersed in the thick shortly conical epigynous disk. Fruit fleshy, containing as many chartaceous cells as there are stigmas.—Unarmed trees or shrubs. Leaves compound. Inflorescence panicled or thyroid.

With the exception of *P. nodosa*, this appears a natural genus, having the leaves digitate, and umbels of flowers arranged in racemes forming thyrses that are usually crowded at the ends of the branches on their young leafless continuations.—We adopt the above name in preference to the older one given by Gærtner, as the latter is not characteristic of the whole genus.

1163. (1) P. *venulosa* (W. & A.:) somewhat arboreous, glabrous: leaves digitate; leaflets 5–7, long-petioled, elliptic, shortly and suddenly pointed, quite entire, coriaceous with the veins prominent: thyrses numerous at the ends of the branches; bracteas none (or caducous); flowers pedicelled and umbelled, numerous: petals and stamens 5: berry 5-celled.—*Wight! cat. n.* 1216.—Hedera terebinthacea, *Wall.! L. n.* 4920.—Aralia digitata, *Roxb. fl. Ind.* 2. *p.* 107; *in E. I. C. mus. tab.* 1229.—*Rheed. Mal.* 7. *t.* 28.——Circars. Courtallum mountains. Malabar.

Rheede most unaccountably describes the berry as 1-seeded, and figures it very unlike any that we have seen, although his section of the ovary is quite correct. "In *Hedera terebinthacea*, which this species most resembles, the style which is single is as long as the filaments, and ends in a single acute stigma; consequently they cannot be the same, though in the Banksian herbarium I believe my plant is marked *H. terebinthiana*."—Roxb.

1164. (2) P. *Wallichiana* (W. & A.:) somewhat arboreous, glabrous: leaves digitate; leaflets 8–10, long-petioled, oblong, pointed, quite entire, coriaceous; veins not prominent: thyrses numerous at the ends of the branches; bracteas caducous; flowers pedicelled and umbelled, numerous: petals and stamens 6: berry 6-celled.—*Wight! cat. n.* 1217.——Courtallum.

Digitized by Google

1165. (3) P. *capitata* (W. & A.:) arboreous?: leaves digitate; leaflets 6–9, long-petioled, oblong, suddenly and shortly acuminated, retuse at the base, quite entire, somewhat coriaceous without prominent veins, furfuraceous when young particularly on the midrib: petiole furfuraceous: thryse elongated, with a concave persistent bractea at the base of the elongated peduncles: flowers sessile, numerous, capitate: berry 6–9-celled.—*Wight! cat. n.* 1218.——Mountains in the Southern provinces.

CL. 4.—EPICOROLLÆ CORISANTHERÆ, *Juss.*

Torus between the tube of the calyx and the ovary, and usually forming at its extremity a small disk (epigynous) on the summit of the ovary, which finally coheres entirely or rarely only at its upper margin with the calyx-tube. Petals usually united into a gamopetalous corolla, or rarely free, inserted on the outside of the disk. Stamens inserted on the corolla. Anthers distinct.

ORDER LXXIX.—LORANTHACEÆ. *Rich. & Juss.*

Calyx with a smaller calyx, or bracteæ, at the base of its tube: limb short, entire or lobed. Petals 4–8, free or more or less united: æstivation valvular. Stamens as many as the petals, and opposite to them: filaments more or less combined with the petals: anthers versatile, or erect, or adnate. Ovarium cohering with the tube of the calyx, 1-celled: ovule solitary: style filiform or almost wanting: stigma capitate. Fruit fleshy, crowned with the calyx, 1-celled: endocarp membranaceous and tough, or somewhat crustaceous, marked with several longitudinal nerves. Seed solitary. Embryo straight in the axis of a fleshy albumen: radicle next the hilum, thickened or truncated at its extremity.—Shrubs, almost all parasitical. Leaves fleshy, entire, opposite or rarely alternate, sometimes wanting.

From this order we exclude *Schœpfia*.

I. VISCUM. *Tourn.; Linn.; Gærtn. fr.* 2. *t.* 27; *Lam. ill. t.* 807.

Flowers dicœcious or moncœcious. Calyx with the margin obsolete and entire. Petals 4 (more rarely 3 or 5), thick, nearly triangular from a broad base, very shortly united at the base into a gamopetalous 4-partite corolla, or distinct, valvate in æstivation. Stamens wanting in the female; in the male without filaments, and with the anthers adnate to the petals and composed of numerous little cells (or bilocular?): ovary in the female cohering with the calyx. Stigma almost sessile, obtuse. Berry umbilicated, internally mucila-

Digitized by Google

ginous. Embryo irregular in its direction, sometimes 2 or 3 in the same seed: extremity of the radicle often (always?) protruded beyond the albumen.—Parasitical shrubs, growing on dicotyledonous trees, all (with one exception) glabrous. Branches terete, tetragonal, or compressed, often jointed. Leaves opposite or rarely alternate, often wanting or reduced to a mere scale. Flowers fascicled, or in spikes.

So far as we can trust to our numerous observations on dried specimens, the direction of the ovule and the situation of the hilum bear a relation to the position of the radicle, but neither are absolutely constant in the same species: thus in *V. orientale* the ovule generally arises from about the bottom of the cell, and the radicle points obliquely downwards; but in other specimens the latter points upwards. In *Loranthus* the direction is probably more regular, the ovule being, we believe, constantly pendulous and the radicle superior. In one or two species of *Viscum* the anthers seemed to be 2-celled, as in *Loranthus*; but as the very few male flowers we have seen were obtained from monœcious specimens, they may perhaps be of a different structure from others found on plants purely male: the calyx was present, nor did the flower-buds exhibit any difference from those of the female except in the presence of anthers and absence of a stigma. Almost all the observations hitherto made on the structure of the flowers, ovarium, and fruit of this genus, have been taken from the European species alone, and principally from *V. album*, so that much yet requires to be done in tropical countries to ascertain, by an examination of growing plants, if the generic characters hitherto given are common to all.

1166. (1) V. *orientale* (Willd.:) stem and older branches terete and even; branches verticillate, or opposite, or dichotomous from the abortion of the central shoot; younger ones furrowed or angled; extreme ones often slightly compressed: leaves from narrow oblong to obovate, attenuated at the base, tapering or rounded at the apex, obtuse or slightly acute, flat, 3- (or in large specimens occasionally but rarely 5-) nerved; nerves (in the dried state) slightly prominent on both sides: peduncles axillary, 3–5-flowered: berry (purple) somewhat globose, copiously and very minutely dotted.—*Willd. sp.* 4. *p.* 737; *Cham. and Schlecht. in Linnæa*, 4. *p.* 200; *DC. prod.* 4. *p.* 278; *Spr. syst.* 1. *p.* 488; *Wall.! L. n.* 491; *Wight! cat. n.* 1219.—V. Heyneanum, *DC. l. c.*—V. cruciatum, *Sieb.*—V. verticillatum, *Roxb. fl. Ind.* 3. *p.* 764 (not *Linn.*)

Very variable as to the shape of the leaves and ramification. We have occasionally found male flowers on the same plant with the female. *V. monoicum* of Roxburgh (fl. Ind. 3. p. 763, or *V. Benghalensis*, Roxb. in E. I. C. mus. tab. 1181) is very closely allied, but differs by the leaves more constantly lanceolate and pointed, and often a little falcate, with in general 5 nerves, by the fascicles of flowers being sessile, by the flowers (generally in threes) inserted in a transversely oblong concave common bractea or cup, the middle one being usually male, and by the berry oval-oblong: from it we cannot distinguish *V. falcatum*, Wall.! L. 492; nor does *V. confertum*, Roxb. fl. Ind. 3. p. 763 (judging by the short character given) appear to differ.

1167. (2) V. *verruculosum* (W. & A.:) stem and older branches terete and even; branches verticillate, or opposite, or dichotomous; younger ones angled and furrowed: leaves from obovate and obtuse to oblong and a little acute, attenuated at the base, flat, 3- (or sometimes 5-) nerved; nerves (in the dried specimen) a little prominent on both sides: peduncles axillary, 3-flowered: berries (very immature) linear-oblong, covered with little warts.—*Wight! cat. n.* 1220.—V. monoicum, *Wight! in Wall.! L. n.* 6875 (not *Roxb.*)

——Dindygul hills, about 3500 feet above the sea.

Dr Wight made the following memorandum when he collected the specimens: "Fruit long, slender, warty; lateral ones of each fascicle cernuous: leaves and plant very like *V. orientale*, of which it is perhaps a variety."

1168. (3) V. *Wallichianum* (W. & A.:) stem and branches terete, swollen at the joints, verticillate, or dichotomous, or opposite: leaves flat, narrow

Digitized by Google

oblong, obtuse, thick and coriaceous, 3-nerved; nerves (in the dried state) scarcely conspicuous on the one side, a little prominent on the other.—*Wight! cat. n.* 1221.—V. Wightianum, *Wall.? L. n.* 6877 (partly?)

The flowers have fallen off; they appear to have been sessile around the tumid joints.

1169. (4) V. *Wightianum* (Wall.:) stem and branches terete, a little swollen at the joints, verticillate or dichotomous: leaves flat, broadly oval, obtuse, very thick and coriaceous, 3-nerved; nerves (in the dried state) obscure on the upper side, quite hid within the substance of the leaf and not at all prominent on the under.—*Wall.! L. n.* 6877; *Wight! cat. n.* 1222.

In this likewise the flowers have fallen off, but they appear to have been as in the last, to which species it is closely allied, although apparently differing in the foliage: our specimens of both are however very imperfect.

1170. (5) V. *capitellatum* (Sm.:) stem and older branches terete; younger branches obscurely 4-angled or compressed, all verticillate or opposite: leaves obovate or spathulate, obtuse, tapering at the base, concave upwards, fleshy, obscurely 3-nerved: peduncles axillary, lower ones about 3 together (or 6 in a verticil), upper often solitary, nearly as long as the leaves, bearing a head of 3–6 sessile flowers: berries oval.—α; leaves all perfect.—*Wight! cat. n.* 1223.—V. capitellatum, *Smith in Rees' cycl.; DC. prod.* 4. *p.* 279.—V. mangiferæ, *Wight! in Wall.! L. n.* 6878.—β; almost all the leaves abortive (or caducous?).—*Wight! cat. n.* 1224.

1171. (6) V. *ramosissimum* (Wall.:) entirely or almost leafless, much branched: stem and branches terete, verticillate or opposite, younger branches usually long and slender: leaves (when present) narrow oblong, 3-nerved: flowers usually 3 together, axillary, sessile or nearly so: berries almost globose.—*Wall.! L. n.* 6876; *Wight! cat. n.* 1225.

1172. (7) V. *grossum* (Wight:) leafless: stems terete, sparingly dichotomous; branches terete, jointed, equal between the joints: flowers fascicled at the joints.—*Wight! in Wall.! L. n.* 6879; *cat. n.* 1226.——Dindygul high hills.

1173. (8) V. *angulatum* (Heyne:) leafless: stems and older branches terete or obscurely many-angled, dichotomous; younger ones opposite or verticillate, 4-angled, jointed, equal between the joints: flowers sessile, opposite or verticillate at the joints: berries nearly globose.—*Wall.! L. n.* 497; *DC. prod.* 4. *p.* 283; *Wight! cat. n.* 1227.——Dindygul hills, at an elevation of 2500 feet.

1174. (9) V. *attenuatum* (DC.:) leafless: branches dichotomous, or opposite, or verticillate, compressed, jointed: articulations elongated, slightly and gradually attenuated from their apex to the base, ten or more times longer than broad, striated longitudinally: flowers 3–5 together on each side of the apex of the joint: berries globose.—*DC. prod.* 4. *p.* 284; *Wight! cat. n.* 1228.—V. opuntioides, *Roxb. fl. Ind.* 3. *p.* 764 (not *Linn.*); *Wall.! L. n.* 496.

We have a plant very similar to this from Jamaica, gathered by the late Dr Wright, and named by him *V. opuntioides*, but which we do not find described in De Candolle's prodromus; it principally differs from the Indian species by the articulations not striated.

1175. (10) V. *moniliforme* (Blume:) leafless: stems terete at the base; branches opposite or fascicled, compressed: articulations obovate-oblong, tapering at the base, 3–4 times longer than broad, costate along the middle but not striated: flowers sessile at the apex of the joints, opposite or in opposite fascicles of 3 together, sometimes nearly verticillate.—*Cham. and Schl. in Linnæa* 3. *p.* 202; *DC. prod.* 4. *p.* 284; *Wight! cat. n.* 1229.

Perhaps we are wrong in referring our plant to Blume's species; we do so principally from the remark made by Chamisso and Schlechtentdal, that the

Digitized by Google

latter is very closely allied to *V. opuntioides* of Linnæus; but then these botanists associate with it a Mauritius species (*V. Tænioides*, Comm.) and a Nepaul one (*V. dichotomum*, Don), to which De Candolle attributes characters at variance with ours. It is strange that De Candolle should in this instance omit the shape of the articulations, by which he distinguishes other species, actually leaving a character insufficient to separate it from most others of the section.

II. LORANTHUS. *Linn.; Lam. ill. t.* 258.—Lonicera. *Gærtn. fr.* 1. *t.* 27.

Flowers usually bisexual. Calyx-tube ovate, rarely turbinate: limb short, truncated or toothed. Petals 4–8, usually 5–6, either distinct or more or less united: æstivation valvular. Stamens as many as the petals and opposite to them: filaments adnate to the base of the petals, free at the apex: anthers 2-celled, adnate, or erect, or versatile. Style filiform. Stigma simple, capitate or turbinate. Berry roundish, or ovate, or oblong, or turbinate, 1-celled, 1-seeded, usually crowned with the limb of the calyx.—Shrubs usually parasitical, rarely growing on the ground. Leaves opposite or alternate, entire, usually thick and coriaceous. Flowers spiked, or racemose, or panicled.

§ 1. *Petals 4–6, equal, distinct or scarcely at all united at the very base: anthers erect or adnate.*—Euloranthus, *DC.*

+ Flowers bisexual, 4-petalled, spiked, their base immersed in excavations of the rachis and subtended by a small bractea adnate to and lining the excavation: anthers adnate.

1176. (1) L. *Hookerianus* (W. & A.:) branches glabrous, terete, speckled with minute tubercles: leaves when young furfuraceous, afterwards glabrous, oblong-lanceolate, acuminated, shortly petioled, opposite or nearly so: spikes axillary, simple, solitary, about the length of the leaves, many-flowered: flowers a little immersed in the excavations of the rachis, furfuraceous: petals 4, linear, (about 2 lines long): anthers ovate, adnate: ovary depressed, crowned with the 4-lobed limb of the calyx: stigma capitate: berries globose. —*Wight! cat. n.* 1230.

+ + Flowers bisexual, 4–5-petalled, short, racemose or panicled, with a cucullate or concave lateral bractea under each flower: petals linear: anthers adnate.

1177. (2) L. *Wallichianus* (Schult.:) glabrous: branches terete: leaves somewhat alternate, ovate, obtuse, acute at the base: racemes 1–3, axillary, a half shorter than the leaves, fascicled at the knots of the branches, simple: flowers small, pedicelled: bractea lateral, cucullate: flower-bud nearly terete: petals 4, linear-cuneate: berry almost globular, at length reflexed.—*Schult. syst.* 7. *p.* 100; *DC. prod.* 4. *p.* 294.—L. polystachyus, *Wall. in Roxb. fl. Ind.* (*ed. Wall.*) 2. *p.* 217 (not *Ruiz and Pav.*)—L. terrestris, *Heyne.*—L. tetrandrus, *Heyne.*——Courtallum.

1178. (3) L. *obtusatus* (Wall.:) branches speckled: leaves opposite or alternate, ovate, rather obtuse, glabrous, petioled: racemes 1–2, axillary, about as long or longer than the leaves, simple: flowers pedicelled: bractea lateral, concave: flower-bud sharply 4-angled: petals 4, linear: berry nearly globose, at length reflexed.—*Wall. L. n.* 566; *Wight! cat. n.* 1231.

§ 2. *Petals 4–6, equal, united from the base to about the middle, and forming a regular 4–6-cleft corolla. Filaments adnate to the petals at the base, free*

Digitized by Google

at the apex. Anthers erect at the apex of the filament.—Symphyanthus, *DC.*

+ Flowers with a solitary bractea under each: corolla tubular, 5-cleft to beyond the middle, the lobes recurved or reflexed, tube scarcely 5-angled, ventricose: anthers erect.

1179. (4) L. *Neelgherrensis* (W. & A.:) glabrous: branches terete, young ones obscurely and bluntly angled: leaves alternate, elliptic-oblong, shortly petioled, thick and somewhat fleshy, ultimate one of the branch (always?) orbicular-ovate: peduncles axillary, aggregated, very short, about the length of the petiole, bearing an umbel of 3–7 very shortly pedicelled flowers: bractea solitary under the ovary and close to it, lateral, ovate: margin of the calyx obscurely repand-toothed: corolla glabrous, ventricosely gibbous at the base, equally 5-cleft to beyond the middle; segments cuneate-linear, recurved.—*Wight! cat. n.* 1232.——Neelgherries.

Of this we have only seen one specimen, and that very imperfect.

++ Flowers sessile, capitate, or decussated and forming a short spike, with 3 roundish concave bracteas under the ovary: corolla tubular, 6- (or occasionally 5-) cleft; lobes linear: flower-buds terete or slightly angled.

1180. (5) L. *loniceroides* (Linn.:) glabrous: branches terete, young ones slightly 2-edged: leaves opposite, petioled, ovate- or oblong-lanceolate, acuminated: peduncles opposite, axillary, solitary, about equal to the petiole, bearing at the apex a few and somewhat capitate or several and more or less spiked sessile flowers: bracteas 3 at the base of each ovary, roundish, acute, concave: margin of the calyx between tubular and cup-shaped, entire: corolla elongated, tubular, curved, slightly gibbous on one side, several times longer than the ovary and calyx, equally cleft into 6 (or sometimes 5) cuneate-linear spreading lobes: anthers linear.—*Linn. sp. p.* 473; *DC. prod.* 4. *p.* 299; *Spr. syst.* 2. *p.* 131; *Wall. in Roxb. fl. Ind.* (*ed. Wall.*) 2. *p.* 216; *L. n.* 506. *a; Wight! cat. n.* 1233.—L. coriaceus, *Desr. in Lam. enc. meth.* 3. *p.* 597.—L. umbellatus, *Heyne! in Roth, nov. sp. p.* 192; *DC. l. c. p.* 316.—*Rheed. Mal.* 7. *t.* 29.——Courtallum.

Although described by several eminent botanists, there is scarcely one specific character strictly accurate: thus Wallich describes the corolla with the limb cleft into 5 segments, while he says the flowers are hexandrous, and he attributes to each flower 4 bracteas: De Candolle says that the peduncles are longer! than the leaf, and that there are 4 bracteas under each head of flowers; Schultes (syst. 7. p. 108), translating from Wallich into Latin, states the same thing, which leads us to suspect that neither of them understood Dr Wallich's description: Blume also appears to have taken up the same erroneous idea, and thus induced De Candolle to refer the species to his section *Involucrati* instead of to *Elytranthes*. Unquestionably the best description is that given by Roth, although he only notices two bracteas to each flower. Rheede's Mal. 7. t. 29. is bad as to the stamens and description of the flower, but, we have no doubt, it belongs to this species.

1181. (6) L. *capitellatus* (W. & A.:) glabrous: branches terete, young shoots compressed and two-edged: leaves opposite, oblong-lanceolate, obtuse, attenuated at the base into a short petiole: petiole sharply keeled at the back: flowers sessile, capitate, few together, each with three roundish acute concave bracteas at the base; heads axillary, sessile: limb of the calyx between tubular and cup-shaped, entire: flower-buds gibbous and nearly terete at the base, 6-angled upwards: corolla-tube short, infundibuliform, about a half longer than the ovary and calyx; limb cleft into 6 equal cuneate-linear spreading segments as long as the tube.—*Wight! cat. n.* 1234.—L. loniceroides, *Wall.! L. n.* 506. *b.*——Malabar coast, on *Artocarpus integrifolia.*

Digitized by Google

+ + + Flowers racemose, subtended each by a single bractea, tubular, slender, 4- (or 5?-) cleft; lobes oblong-linear: flower-bud terete.

†1182. (7) L. *recurvus* (Wall.:) branches terete, when old glabrous: leaves alternate, petioled, elliptical, obtuse, acute at the base, nearly glabrous: peduncles axillary and lateral, branched, 2–5-flowered, and with the densely pubescent flowers recurved: bractea broad, obliquely cup-shaped: limb of the calyx cup-shaped and toothed: flower-bud terete: lobes of the corolla 5, oblong: anthers oblong: stigma scarcely capitate.—*Wall. L. n. 525; DC. prod.* 4. *p.* 299.——Neelgherries; *Noton.*

This we have not seen; De Candolle defines the section with constantly 4-cleft flowers, but describes this species with them 5-cleft, an obvious error in the one or the other which we cannot rectify. De Candolle further introduces into this section *L. graciliflorus*, although it has the tube 4-angled at the base; but that species, on the supposition that *L. gracilifolius*, Schult, is the same (about which we with De Candolle have no doubt), has the tube split down longitudinally almost to the base on one side, and therefore belongs to the section of *Scurrula* with four stamens. *L. Heynei*, DC. (not Schult.), must also be removed to the same section.

§ 3. *Corolla tubular, 4–5-cleft at the apex, often gibbous at the base, split down longitudinally on one side* (*as in* Lobelia). *Filaments adnate to the petals for a long way, free at the apex. Anthers adnate to or erect at the apex of the filament.*

+ Stamens and lobes of the corolla 4.

1183. (8) L. *buddleioides* (Desr.:) branches terete, glabrous, young shoots sometimes tomentose: leaves opposite, petioled, from elliptical to cordate-ovate, rather obtuse, thinnish, firm, at first puberulous or furfuraceous, particularly on the under side, soon glabrous on the upper, at length often glabrous on the under: peduncles axillary, crowded, very short, simple, few-flowered: bractea small, lateral at the base of the ovary, and with the peduncles, ovary, calyx and corolla, covered with a mealy tomentum: flowers nearly sessile: ovary turbinate: margin of the limb of the calyx entire, thickish, incurved: flower-bud clavate at the apex: fruit turbinate.—*Desrousseaux in Lam. enc. meth.* 3. *p.* 600; *DC. prod.* 4. *p.* 302; *Spr. syst.* 2. *p.* 131.—*α*; leaves cordate-ovate; tomentum whitish.—*Wight! cat. n.* 1235.—L. Scurrula, *Roxb.* (not *Linn.*?) *fl. Ind.* 1. *p.* 550, *and* 2. *p.* 186; (*ed. Wall.*) 2. *p.* 206; *DC. l. c. p.* 301.—*β*; leaves oval, nearly glabrous on the upper side, puberulous on the under when old, slightly rugose.—*Wight! cat. n.* 1236.—L. pyrifolius, *Wight! in Wall.! L. n.* 6869 (not *H. B. K.*).—*γ*; leaves nearly orbicular, furfuraceous on both sides; tomentum whitish.—*Wight! cat. n.* 1237.—L. tomentosus, *herb. Madr.!*—*δ*; leaves elliptic-oblong, furfuraceous on the under side; tomentum on the young parts rust-coloured.—*Wight! cat. n.* 1238.—L. Scurrula, *Wall.! L. n.* 6867 (partly).—L. Heyneanus, *Wall.! L. n.* 528 (not *Schult.*)—L. Heynei, *DC. l. c. p.* 300.—*ε*; leaves elliptic, when young covered on the under side with a very thin white mealiness, soon quite glabrous on both sides; flowers with a pale tawny-coloured short pubescence.—*Wight! cat. n.* 1239.—L. Scurrula, *Wall.! L. n.* 6867 (partly).

A variable plant as to the foliage, but otherwise constant: the ovary resembles that of some species of *Syzygium*. We ought perhaps to add to our var. *α*, *L. cordifolius* of Wallich, but the branches and corolla are described to be villous. Our var. *γ* is from Ceylon, the others from various places in the southern districts of the Peninsula.

+ + Stamens and lobes of the corolla 5.

1184. (9) L. *memecylifolius* (W. & A.:) glabrous: branches very woody, terete; leaves narrow-oblong, obtuse, attenuated at the base into a short pe-

Digitized by Google

tiole, coriaceous, alternate or somewhat opposite: peduncles 1–3 together, axillary or in the axils of the fallen leaves, short, about the length of the petiole, bearing at the apex an umbel of 2–5 shortly pedicelled flowers; bractea lateral, obliquely cupulate, close to the ovary: ovary cylindric-oblong: limb of the calyx cup-shaped, irregularly and bluntly 5-toothed: flower-bud equal, 5-angled, slightly tumid a little above the middle: corolla 5-cleft, one of the fissures considerably deeper than the others; lobes about equal to the tube, cuneate-linear, acuminated: anthers linear.—*Wight! cat. n.* 1240.

1185. (10) L. *sarcophyllus* (Wall.:) glabrous: branches terete: leaves somewhat alternate, elliptic or obovate, obtuse, attenuated at the base into a short thick petiole, thick and fleshy: racemes 1–3 together, axillary or from the knots of the branches, spreading, 6–12-flowered: flowers pedicelled, drooping; bractea minute, lateral, close to the short cylindrical ovary: limb of the calyx bluntly and irregularly 5-toothed: corolla fleshy, curved, 5-cleft, one of the fissures the longest; lobes very narrow, cuneate-linear, acuminated: anthers linear.—*Wall.! L. n.* 6863; *Wight! cat. n.* 1241.——Cumbum, on a species of *Ficus*.

1186. (11) L. *longiflorus* (Desr.:) glabrous: branches terete: leaves usually opposite, or sometimes alternate, petioled, from linear to oblong-lanceolate, or ovate obtuse, upper ones sometimes retuse or slightly cordate at the base, coriaceous: racemes axillary, solitary or in pairs, erect or spreading, simple, many-flowered, much shorter than the leaves: flowers (yellow) shortly pedicelled, often drooping; bractea solitary, concave, oblique, close to the ovary: calyx-limb entire: corolla long, infundibuliform, gibbous on one side, curved; limb before expansion swollen at the base, constricted above it, oblong upwards, splitting into 5, linear, recurved, secund segments, one of the fissures twice as deep as the others: filaments sprinkled with short bristles; anthers linear: fruit oblong.—Lonicera zeylanica, *Gærtn.? fr.* 1. *p.* 137. *t.* 27.—*α*; leaves ovate, or oval, or oblong-lanceolate, obtuse or slightly cordate at the base.—*Wight! cat. n.* 1242.—L. longiflorus, *Desrousseaux in Lam. enc. meth.* 3. *p.* 498; *Wall.! in Roxb. fl. Ind.* (*ed. Wall.*) 2. *p.* 217; *L. n.* 507; *DC. prod.* 4. *p.* 304; *Spr. syst.* 2. *p.* 132.—L. bicolor, *Roxb. cor.* 2. *t.* 139; *fl. Ind.* 1. *p.* 548, *and* 2. *p.* 185; (*ed. Wall.*) 2. *p.* 205; *DC. l. c. p.* 305; *Spr. l. c. p.* 129.—L. Koenigianus, *Agardh in Schult. syst.* 7. *p.* 108; *DC. l. c. p.* 307.—*Rheed. Mal.* 10. *t.* 4.—*β*; leaves narrower, linear or linear-lanceolate, usually acute at the base; ovary sometimes pubescent.—*Wight! cat. n.* 1243.—L. bicolor (narrow leaved), *Roxb. l. c.*—L. Wightianus, *Wall.! L. n.* 6872.—*γ*; leaves narrow-linear, thick-coriaceous, often falcate.—*Wight! cat. n.* 1244.—L. falcatus, *Linn. suppl. p.* 211; *DC. prod. l. c. p.* 305; *Spr. l. c. p.* 129; *Wall.! L. n.* 519.

Between these varieties there are no certain limits, indeed agreeing as they do in so many particulars, and differing only in the foliage, we would not have so separated them, had not preceding botanists, from a limited supply of specimens, attempted to give characters to many of our synonyms to serve for their discrimination as species. We believe the corolla in the living plant is always of a greenish yellow colour, but it frequently becomes red by drying.—In justice to Linnæus, we ought to have adopted the specific name *falcatus*, but it is only applicable to an extreme state of the plant: that of Lamarck is less objectionable.

1187. (12) L. *amplexifolius* (DC.:) glabrous: branches terete: leaves opposite, sessile, orbicular or ovate, obtuse, cordate at the base, coriaceous; racemes axillary, solitary, many-flowered, erect or spreading, simple, shorter than the leaves: flowers (purple) shortly pedicelled, often drooping; bractea solitary, lateral, concave, orbicular, close to the ovary: calyx-limb cup-shaped, entire: corolla long, infundibuliform, gibbous on one side, curved; limb before expansion swollen at the base, constricted above it, oblong up-

Digitized by Google

wards, splitting into 5 linear-spathulate recurved unilateral segments, one of the fissures twice as long as the others: filaments sprinkled with minute bristles: anthers linear: berry oblong.—*DC. prod.* 4. *p.* 305; *Wight! cat. n.* 1245.—L. amplexicaulis, *Wall.! L. n.* 520.——Neelgherries. Dindygul.

We have detailed the character so as to shew its affinity with *L. longiflorus*; the foliage and colour of the flowers are the only points of difference, but at the same time we consider the two quite distinct.

1188. (13) L. *tomentosus* (Heyne:) all over greyish with starry tomentum: branches terete: leaves alternate, roundish-obovate, obtuse, somewhat cuneate at the base, petioled, at length nearly glabrous on the upper side: peduncles axillary, solitary, bearing an umbel of 3–5 pedicelled villous flowers; bractea foliaceous, much larger than the ovary, unilateral, close to the ovary, cuneate-obovate, obtuse: calyx-limb 5-toothed: corolla tubular, gibbous on one side above the middle, curved, splitting into 5 linear recurved unilateral segments, one of the fissures much deeper than the others: filaments muricated: anthers linear.—*Heyne in Roth, nov. sp. p.* 191; *Schult. syst.* 7. *p.* 105; *Wight! cat. n.* 1246.—L. bracteatus, *Heyne in Roxb. fl. Ind.* (*ed. Wall.*) 2. *p.* 220 (not *Rich.*); *Wall.! L. n.* 510; *DC. prod.* 4. *p.* 306; *Spr. syst. suppl. p.* 141.—L. Heyneanus, *Schult. l. c. p.* 106.——Gingie and Dindygul hills.

1189. (14) L. *Candolleanus* (W. & A.:) when young all over greyish with very short starry pubescence: branches terete: leaves alternate or fascicled in pairs, narrow-oblong, obtuse, cuneate at the base, petioled, at length nearly glabrous on both sides: umbels peduncled; flowers 2–5, shortly pedicelled, clothed with a short tomentum: bractea about the length of the ovary and close to it, unilateral, cuneate-linear, obtuse: calyx-limb 5-toothed: corolla tubular, gibbous on one side above the middle, curved, 5-cleft; segments unilateral, linear, one of the fissures the longest: anthers linear.—*Wight! cat. n.* 1247.—L. montanus, *Wight!* (partly) *in Wall. L. n.* 6866.——Cunnawady.

Perhaps too closely allied to *L. tomentosus*, but the leaves are much narrower, the bracteas much narrower and shorter, and the whole plant, but particularly the flower, more glabrous.

1190. (15) L. *goodeniiflorus* (DC.:) branches terete, glabrous: leaves alternate, obovate-cuneate, obtuse or emarginate, attenuated into a petiole, sparingly veined, old ones glabrous, when very young hoary with a starry pubescence: peduncles axillary, very short, 2–3-flowered: bractea solitary, close under the ovary, ovate, acute: ovary pubescent, crowned with 5 somewhat ciliated teeth: corolla cylindrical, split down on one side, with 5 linear reflexed lobes: style filiform.—*DC. prod.* 4. *p.* 306; *Wight! cat. n.* 1248.—L. viscifolius, *Wight! in Wall.! L. n.* 6868 (not *Kunth*).——Cumbum. Madura hills.

Dr Wight's plant is not in flower, so that we have some doubts if it be identical with De Candolle's: our character is adopted from that author. Perhaps as a species it is not distinct from the next; in our specimens the leaves are much larger.

1191. (16) L. *cuneatus* (Heyne:) glabrous: branches terete: leaves alternate, obovate-cuneate, obtuse or retuse, tapering into the petiole, sparingly veined: flowers 1–3, pedicelled, axillary or from a very short axillary peduncle; bractea solitary, close under the ovary, ovate, acute: ovary glabrous, or when very young minutely pubescent, crowned with the 5 slightly ciliated divisions of the limb of the calyx: corolla sometimes at first canescent, soon quite glabrous, slightly gibbous above the middle on one side, curved, 5-cleft, one of the fissures twice as deep as the others; segments linear, reflexed, unilateral: style filiform: fruit ovoid, glabrous.—*Heyne in Roth, nov. sp. p.* 193 (not *Wall.* nor *DC.*); *Schult. syst.* 7. *p.* 105; *Wight! cat. n.* 1249.—L. lobeliiflorus, *DC. prod.* 4. *p.* 306.—L. montanus, *Wight!* (partly) *in*

Digitized by Google

Wall.! L. n. 6866.——Neelgherries; *Leschenault.* Cunnawady and other hills near Dindygul.

1192. (17) L. *elasticus* (Desr.:) glabrous, dichotomous: branches terete: leaves sessile, oblong or ovate-lanceolate, usually attenuated with a blunt point at the apex and acute at the base, thick and coriaceous, obscurely 5-nerved; two of the lateral nerves from the base, the other two from the mid-rib below the middle: flowers sessile or nearly so, fascicled around the knots of the branches: ovary with a solitary adpressed bractea at its base: limb of the calyx entire, cup-shaped: corolla infundibuliform, 5-cleft, one of the fissures deeper than the others; segments long, narrow-linear, elastically revolute: limb before expansion tumid at the base, then tapering and forming a long sharp beak as long as the tube: anthers oblong-linear: fruit ovoid.—*Desrousseaux in Lam. enc. meth.* 3. *p.* 599; *DC. prod.* 4. *p.* 306; *Spr. syst.* 2. *p.* 131; *Wall.! in Roxb. fl. Ind.* (*ed. Wall.*) 2. *p.* 217; *L. n.* 508; *Wight! cat. n.* 1250.—*Rheed. Mal.* 10. *t.* 3.

Species not sufficiently known.

†1193. (18) L. *trigonus* (W. & A.:) glabrous: branches acutely triangular: leaves somewhat verticillate in threes, petioled, oval, obtuse, obtuse or slightly cuneate at the base, coriaceous; petiole thick: peduncles lateral, very short, bearing a short almost umbel-shaped raceme of a few approximated pedicelled spreading flowers: bractea solitary under the fruit and close to it unilateral, ovate: limb of the calyx cupulate, irregularly and bluntly (5?-) toothed: berry obovoid.—*Wight! cat. n.* 1251.

†1194. (19) L. *biflorus* (Desr.:) glabrous: branches terete: leaves petioled, ovate-roundish, thickish: petioles channelled: peduncles solitary or in pairs, axillary, a little shorter than the petioles, bearing 2 flowers on pedicels about the length of the peduncle: bractea solitary under the ovary, and girding its base, lateral, ovate, short: limb of the calyx truncated: flower-bud slender, much curved, slightly clavate at the apex, covered with a thin rusty pubescence.—*Desrousseaux, in Lam. enc. meth.* 3. *p.* 600; *DC. prod.* 4. *p.* 302; *Spr. syst.* 2. *p.* 128.

The number of stamens and structure of the corolla do not appear to be known; Schultes places it among some hexandrous American species: De Candolle next to *L. buddleioides*, with which Desrousseaux himself points out an affinity; no good character is given to separate it from that species, and we would have therefore combined them, but among the numerous specimens before us, not one happens to agree precisely with the description.

†1195. (20) L. *turbinatus* (DC.:) glabrous: branches terete: leaves somewhat alternate, shortly petioled, oval or oblong, obtuse or slightly acute, thick: peduncles axillary, much shorter than the leaf, 2–3-cleft: bractea ovate, solitary under the turbinate ovary: limb of the calyx unequally and obtusely 5-cleft.—*DC. prod.* 4. *p.* 305.——Neelgherries; *Leschenault.*

If the calyx had been 4-cleft instead of 5-cleft, we would have referred this without hesitation to *L. buddleioides*, var. *i.*

†1196. (21) L. *rugulosus* (Roth.:) glabrous: branches terete, ultimate ones compressed: leaves opposite or alternate, very shortly petioled, oblong-elliptical, obtuse, glaucous, rugulose-reticulated, with a smooth cartilaginous margin: racemes axillary, opposite, simple, shorter than the leaf; pedicels recurved: bractea solitary, lateral, orbicular, concave, embracing the base of the calyx and close pressed to it: calyx-limb truncated, slightly oblique, with a minute tooth on one side: flower-bud terete: corolla tubular, glabrous, gibbous about the middle, curved, 4-cleft; segments lanceolate, obtuse: anthers linear.—*Roth, nov. sp. p.* 194; *Schult. syst.* 7. *p.* 101; *DC. prod.* 4. *p.* 317.

Digitized by Google

Sent to Roth by Heyne: we are not informed if the corolla be equally split down.

† 1197. (22) L. *Kanneli* (Schult.:) glabrous: branches terete: leaves opposite, elliptic-oblong, shortly petioled, thick: racemes short, lateral, 4–7-flowered: corolla small, tubular, 4-cleft (or 4-petalled): fruit ovoid.—*Schult. syst.* 7. *p.* 153.—*Rheed. Mal.* 10. *t.* 5.

From an inspection of Rheede's magnified figures, and a comparison of the flower with that of our *L. Hookerianus*, which agrees in size and colour, we are inclined to consider this as a tetrapetalous species. It has no relation to *L. globosus*, a hexandrous plant, to which Roxburgh and De Candolle refer it. Rheede states that there is a tree called *Kanneli*, growing upon which is found the present species, and therefore called *Kanneli-Itti-Kanni*; and we suspect that he has introduced into his figure a part of the tree, as well as the parasite; it is thus extremely difficult to separate the two, the more as he has represented the leaves as quite the same; the branch bearing ripe fruit resembles a *Memecylon*.

† 1198. (23) L. *Mitchellii* (Wall.)—*Wall. L. n.* 6865.

ORDER LXXX.—CAPRIFOLIACEÆ. *Juss.*

Calyx with its limb 5- (very rarely 4-) lobed. Corolla of one piece, lobed, sometimes irregular; the divisions alternate with those of the calyx: æstivation never valvular *(D. C.)* Stamens equal in number to the lobes of the corolla (or sometimes one of them abortive), alternating with them, and inserted towards its base: filaments subulate: anthers ovate, bilocular. Ovarium cohering with the tube of the calyx, 3-celled (rarely 4- or 5-celled): ovules few in each cell, pendulous: style one and exserted, or none: stigmas as many as the cells, either distinct or combined into one capitate stigma. Fruit crowned by the limb of the calyx, fleshy or rarely almost dry, plurilocular or 1-celled (either by the disappearance of the dissepiments or by the abortion of the other cells). Seeds solitary, in pairs, or several (some often abortive) in each cell, pendulous. Embryo straight, in the centre of a fleshy albumen: radicle superior, next the hilum.—Shrubs. Leaves opposite, without stipules (or rarely with 2 small stipules or glands at the base of each petiole). Flowers terminal, corymbose, or axillary.

TRIBE I.—SAMBUCEÆ. *Kunth.*

Corolla regular, rotate, seldom tubular. Style none, or very short. Stigmas 3, nearly sessile. Raphe on the inner side of the ovule. Endocarp bony. Testa of the seed membranous.

I. SAMBUCUS. *Tourn.; Linn.; Gærtn. fr. t.* 27; *Lam. ill. t.* 211.

Limb of the calyx small, 5-cleft. Corolla rotate or urceolate, 5-cleft; the lobes obtuse. Stamens 5. Style wanting. Stigmas 3, sessile. Berry roundish, scarcely crowned with the limb of the calyx, pulpy, 1-celled, 3–5-seeded. Podosperms in the axis of the berry. Seeds oblong, angled on one side. —Shrubs or herbaceous plants with a heavy swell. Leaves opposite, unequally pinnated; the divisions toothed or serrated, sometimes again pinnated

Digitized by Google

or laciniated, with two stipules or glands at the base of the petiole. Corymbs or cymes terminal, sometimes flat-topped, sometimes thyrsoid. Flowers white, or occasionally reddish.

1199. (1) S. *Wightianus* (Wall.:) stem herbaceous, smooth: stipules small, foliaceous: leaves pinnated; leaflets 5–7, linear-lanceolate, sharply serrated, glabrous: corymbs 3–5-partite: flowers minute, monœcious?—*Wall.! L. n.* 6303; *Wight! cat. n.* 1252.

We only possess one and a very indifferent specimen.

II. VIBURNUM. *Linn.; Gærtn. fr.* 1. *t.* 27; *Lam. ill. t.* 211.

Limb of the calyx small, 5-cleft, persistent. Corolla rotate, somewhat campanulate, or tubular, 5-lobed. Stamens 5, equal. Style none or short. Stigmas 3. Berry by abortion 1-seeded, ovate or globose, crowned with the teeth of the calyx. Seed compressed.—Shrubs. Leaves opposite, petioled, entire or lobed. Corymbs terminal. Flowers white, or slightly reddish.

§ 1. *Flowers all equal and fertile: corolla rotate or scarcely somewhat campanulate: seed oval.*—Lentago, *DC.*

1200. (1) V. *acuminatum* (Wall.:) young branches, petioles, and peduncles dotted with small rusty-coloured scales: leaves elliptical, acuminated at both ends, coriaceous, quite entire with the margin slightly recurved, glabrous: upper side shining, under covered with minute shining rusty-coloured dots: corymb terminal, large, trichotomous, often larger than the leaves: stigmas sessile: berry oval-oblong.—*Wall.! L. n.* 465; *DC. prod.* 4. *p.* 325; *Wight! cat. n.* 1253.

1201. (2) V. *capitellatum* (W. & A.:) free from scales, quite glabrous except in the axils of the nerves: leaves oval-lanceolate, with a few distant wavy teeth, attenuated at the apex into a rather fine point, under side with the axils of the nerves woolly: cymes compound, somewhat umbel-shaped, 3–6-partite; flowers umbellate, several together, nearly sessile at the extremity of the ultimate divisions: flower-buds viscous and shining: stigmas sessile: berries oval-oblong.—*Wight! cat. n.* 1254.

§ 2. *Flowers all equal and fertile: corolla obconical or cylindrical-tubular: seed oval-oblong.*—Solenotinus, *DC.*

1202. (3) V. *hebanthum* (W. & A.:) branches, petioles, and general peduncles glabrous: leaves elliptical or obovate, shortly acuminated, obtuse or acute at the base, slightly sinuate-toothed on the lower half, coarsely so towards the apex, woolly in the axils of the nerves on the under side, otherwise glabrous: partial peduncles of the corymb pubescent: corolla tubular-campanulate, softly pubescent, limb very small, nearly erect, 4–5 times shorter than the tube: style very short and thick.—*Wight! cat. n.* 1255.

1203. (4) V. *Wightianum* (Wall.:) branches, petioles, peduncles, pedicels, and flowers glabrous: leaves oval, shortly acuminated, obtuse at the base, quite entire on the lower half, sharply serrated towards the apex; upper side glabrous; under slightly puberulous when young, nearly glabrous when old, the nerves densely pubescent and their axils woolly: corymb shortly peduncled, somewhat panicle-shaped: bracteas linear, pubescent and ciliated: corolla hypocrateriform; limb spreading, conspicuous, about 4 times shorter than the tube: ovary linear: style very short and thick.—*Wall.! L. n.* 3729; *Wight! cat. n.* 1256.—Neelgherries.

Digitized by Google

Flowers unknown.

1204. (δ) V. *pubigerum* (W. & A.:) young branches petioles and peduncles sprinkled with simple or solitary hairs: leaves oval, shortly acuminated, obtuse at the base, quite entire on the lower half, irregularly serrated towards the point; upper side glabrous; under sprinkled on the nerves with stellate-pubescence and fascicled hairs, slightly hairy on the veins, woolly in the axils of the nerves: corymb peduncled; partial peduncles and pedicels closely hairy: style very short and thick: fruit oval-oblong.—*Wight! cat. n.* 1257.

TRIBE II.—LONICEREÆ. *R. Brown.*

Corolla more or less tubular, often irregular. Style filiform. Raphe on the outer side of the ovule.

III. LONICERA. *Desf.; Lam. ill. t.* 150.

Calyx 5-toothed. Corolla tubular, campanulate, or infundibuliform: the limb 5-cleft, often irregular. Stamens 5. Style filiform. Stigma capitate. Berry 3- (or by abortion sometimes 2-) celled, the cells few-seeded. Seeds crustaceous.—Erect or climbing shrubs. Leaves opposite, sometimes connate, entire or occasionally slightly runcinate. Inflorescence axillary, various.

§ 1. *Leaves never connate. Pedicels axillary, 2-flowered at the apex. Berries in pairs, distinct, or more or less united, younger ones 3-, older ones sometimes 2-celled, not crowned with the deciduous limb of the calyx.*—Xylosteon, *DC.*

1205. (1) L. *Leschenaultii* (Wall.:) twining, tomentose or villous all over except the upper side of the leaves: leaves ovate, acute, slightly cordate at the base, quite entire; under side veined, more prominently so when old; upper always glabrous: peduncles very short, 2-flowered, axillary and solitary or terminal and fascicled: bracteas 3 under each flower, the two lateral ones short and roundish, the middle one longer and subulate: calycine teeth subulate: tube of the corolla equal at the base, long, villous or pubescent: berries distinct.—α; under side of the leaves villous, with the veins not very prominent; corolla villous.—*Wight! cat. n.* 1258.—L. Leschenaultii, *Wall. in Roxb. fl. Ind.* (*ed Wall.*) 2. *p.* 178; *L. n.* 471; *DC. prod.* 4. *p.* 334; *Spr. syst. suppl. p.* 83.—β; under side of the leaves prominently reticulated, shortly tomentose, glaucous; corolla pubescent.—*Wight! cat. n.* 1259.—L. mollis, *Wall.! L. n.* 6301.——α, Neelgherries; *Leschenault.* Cunnawady.—β, Neelgherries.

We can perceive no other difference between these than what we have above pointed out, nor are they probably constant.

1206. (2) L. *ligustrina* (Wall.:) stem somewhat erect and bushy; branches slender, slightly twining, younger ones hairy or pubescent: leaves shortly petioled, ovate-lanceolate, acute, obtuse at the base, quite entire, shining, sprinkled on the margin and when young on the midrib beneath with spreading hairs: peduncles a little longer than the petioles, slightly drooping at the apex, 2-flowered, axillary and solitary: bracteas, a subulate one at the back of each ovary, and one cup-shaped closely surrounding and containing both ovaries: calyx-limb constricted in the middle, the margin 5-toothed; teeth oblong, short: corolla puberulous, infundibuliform; tube rather short, gibbous on one side at the base; berries distinct, both covered by the common bractea.—*Wall.! in Roxb. fl. Ind.* (*ed Wall.*) 2. *p.* 179; *L. n.* 479; *DC. prod.* 4. *p.* 334; *Spr. syst. suppl. p.* 82; *Wight! cat. n.* 1260.——Neelgherries.

Digitized by Google

ORDER LXXXI.—RUBIACEÆ. *Juss.*

Tube of the calyx cohering with the ovarium; the limb various, truncated or lobed, consisting of as many sepals as petals, rarely with accessory intermediate teeth. Petals 4–5, rarely 3–8, united, inserted upon the summit of the tube of the calyx: æstivation twisted or valvate. Stamens as many as the lobes of the corolla, alternate with them (rarely some of them suppressed): filaments more or less combined with the tube: anthers oval, 2-celled, turned inwards: pollen elliptical. Ovarium adherent, usually 2-celled, or with several cells, rarely (by abortion) 1-celled, crowned by a fleshy often urceolate disc: style single, sometimes partly divided: stigmas usually 2, rarely several distinct, or more or less concrete. Fruit a cremocarpium, or capsular, or baccate, or drupaceous, 2- or many-celled. Seeds one or many in each cell, in the former case attached to the apex, or more usually to the base of the cell; in the latter to a central placenta. Albumen horny or fleshy, copious. Embryo straight or slightly curved, inclosed in the albumen: radicle turned to the hilum: cotyledons foliaceous.—Leaves simple, entire, opposite (very rarely verticillate): stipules 2 at the base of each leaf, entirely distinct, or cohering either with the leaf or with each other, or both ways; their apex sometimes produced into bristles, sometimes into foliaceous expansions resembling verticillate leaves.

Under this order will be found several species described by botanists, with which we are quite unacquainted except from the characters given: there are others which we have introduced apparently for the first time. We have, however, very strong suspicions that many of the former occur among Dr Wight's plants either as species or varieties; but although we have paid some attention to the subject, we have not been able to discover to which they respectively belong. Of the latter we are quite satisfied that most may be found already noticed by Willdenow, Lamarck, Roth, or Roxburgh; but from the vagueness with which, in general, the descriptions of the more important organs have been drawn up, and from the great changes that have taken place of late years among the genera, it is now almost impossible to clear up the older synonyms without an actual examination of the original specimens.—*Triosteum hirsutum*, Roxb. and DC., according to an imperfect specimen in Dr Wight's herbarium, certainly belongs to the *Rubiaceæ*, not to *Caprifoliaceæ*, and appears to be a species of *Mephitidia* of Blume (*M. Roxburghii*, W. & A.): it has not, that we know of, been found on the Peninsula. *Nonatelia? hispida*, Wall. in Roxb. fl. Ind. (ed. Wall.) 2. p. 187, is also a species of *Mephitidia* (*M. Wallichii*, W. & A.)

TRIBE I.—CINCHONACEÆ. *DC.*

Fruit capsular, 2-celled; cells many-seeded. Seeds winged or caudate. Albumen fleshy.—Trees or shrubs. Leaves opposite, with stipules between the petioles.

SUBTRIBE I.—NAUCLEÆ. *DC.*

Flowers capitate, sessile upon a globose receptacle.

1. NAUCLEA. *Linn.; Gærtn. fr.* 1. *t.* 30; *Lam. ill. t.* 153.

Calyx-tube oblong: limb either short and truncated or 5-partite with linear lobes. Corolla infundibuliform: tube slender with the throat naked:

Digitized by Google

lobes 5, patent, oval-oblong. Anthers either included or protruded, shorter than the lobes of the corolla. Style filiform, protruded. Stigma oblong or ovate, tumid, undivided. Capsules 2-celled, sessile upon a receptacle, not tapering gradually at the base. Seeds several, imbricated, winged or with a gland at the hilum, attached to an oblong placenta that is adnate to the dissepiment. Embryo inverted in a fleshy albumen.—Unarmed trees or more rarely shrubs. Leaves opposite, or 3–4 verticillate, petioled or sessile. Stipules interpetiolar, deciduous. Partial peduncles terminal at the end of the branches, or at the extremity of 2-leaved terminal or axillary general peduncles, bearing each one globose head of sessile flowers. Bracteas or floral leaves at the end of the general peduncle, none at the base of the head. Paleæ or bracteoles among the flowers, linear.

In this genus much confusion has been created by botanists not distinguishing between the partial peduncle and the general one which bears it: the line of demarcation is however well marked, by either a pair of small leaves or bracteas, or when they fall off by the presence of a joint. From this reason the old figures cannot be referred to satisfactorily, nor even the specific characters hitherto given in systematic works. The length of the general peduncle is often of little consequence, while that of the partial one may assist in distinguishing species.

§ 1. *Lobes of the calyx short or wanting: capsules free from each other.*

1207. (1) N. *parvifolia* (Roxb.) arborescent, glabrous except in the axils of the nerves on the under side of the leaves: branches brachiate: stipules oval: leaves petioled, ovate or oval or obovate-obtuse or with a short bluntish point: general peduncles opposite, terminal, resembling and often passing into floriferous shoots, bearing a pair of small deciduous leaves; partial ones scarcely so long as the globose head of flowers, the terminal one on the branch usually without a general one: limb of the calyx very short and almost truncated: lobes of the corolla spreading: anthers shortly protruded: style long; stigma narrow-oblong, calyptriform: capsules containing 2 cocci splitting at the inner angle.—*Roxb. Cor.* 1. *t.* 52; *fl. Ind.* 1. *p.* 513; (*ed Wall.*) 2. *p.* 122; *DC. prod.* 4. *p.* 344; *Spr. syst.* 1. *p.* 750; *Wall.! L. n.* 6093; *Wight! cat. n.* 1261.— N. parviflora, *Pers. syn.* 1. *p.* 202.—N. orientalis, *Linn.?*; *Gært. fr.* 1. *t.* 30.—Cephalanthus pilulifer, *Lam. enc. meth.* 1. *p.* 678; *DC. l. c. p.* 539; *Spr. l. c. p.* 377.

Notwithstanding that Linnæus refers to Rheede's figure, we suspect the present to be his *Cephalanthus* or *Nauclea orientalis*: Lamarck's plant of the same name is from the Moluccas, but it also may, judging by the figure given in the illustrations, prove not to be distinct. *Cephal. pilulifer* is this species with the flowers fallen off, leaving the head of ovaries about the size of a pea.

§ 2. *Calyx-lobes elongated, club-shaped: capsules distinct.*

1208. (2) N. *cordifolia* (Roxb.) arboreous: stipules oval: leaves petioled, cordate, roundish, pubescent on the upper side, tomentose on the under: general peduncles 1–3 together, axillary, bearing at the apex a pair of small scariose roundish deciduous bracteas; partial one shorter than the general, rather longer than the globose head of flowers: calyx-segments clavate: corolla pubescent; lobes spreading: anthers slightly protruded: style long; stigma shortly clavate or almost capitate.—*Roxb. Cor.* 1. *t.* 53; *fl. Ind.* 1. *p.* 514; (*ed. Wall.*) 2. *p.* 122; *DC. prod.* 4. *p.* 346: *Spr. syst.* 1. *p.* 750: *Wall.! L. n.* 6092; *Wight! cat. n.* 1262.

1209. (3) N. *purpurea* (Roxb:) arborescent, glabrous: stipules oval, obtuse, caducous: leaves petioled, oval-oblong, acute or acuminated at both extremities: peduncles terminal, solitary or in threes, with often two deci-

Digitized by Google

duous small leaves at the apex: partial ones about as long as the diameter of the head of flowers, usually shorter than the general one: tube of the calyx glabrous; limb hirsute, segments clavate: corolla glabrous; lobes spreading: anthers scarcely exserted: style long: stigma somewhat capitate: capsule-valves 4, splitting from the base upwards.—*Roxb. Cor.* 1. *t.* 54; *fl. Ind.* 1. *p.* 515; (*ed. Wall.*) 2. *p.* 123; *DC. prod.* 4. *p.* 346; *Spr. syst.* 1. *p.* 750; *Wall.! L. n.* 6090; *Wight! cat. n.* 1263.—N. Cadamba, *Wall.! L. n.* 6088. *g.*—*Rheed. Mal.* 3. *t.* 33

Cephalanthus chinensis, Lam., usually referred here, can scarcely be this species. We have been induced to quote Rheede's figure in this place, instead of considering it to be *N. Cadamba*, Roxb. (*N. orientalis*, Roxb. in E. I. C. mus. tab. 907), from this reason, that in *N. Cadamba* the leaves are obtuse at the base, the flowers sweet-scented, and the lobes of the corolla erect; whereas, in Rheede's plant, the leaves taper at the base, the flowers are inodorous, and the lobes of the corolla are spreading, as in *N. purpurea*: the only objection against our supposition may arise from the colour of the flowers being said by Rheede to be yellow; but to counterbalance this, *N. Cadamba* is from Bengal, and not a native of the Peninsula.

*† 1210. (4) N. *Missionis* (Wall.)—*Wall. L. n.* 6099.—N. orientalis, *herb. Madr.*

SUBTRIBE II.—CINCHONEÆ. *DC.*

Flowers more or less pedicelled, not seated on a globose receptacle.

II. HYMENODYCTION. *Wall.*—Cinchona. *Roxb.* (not *Linn.*)

Calyx-tube ovate: limb 5-toothed. Corolla infundibuliform, the limb 5-lobed. Stamens very short: filaments glabrous, inserted under the throat of the corolla; anthers slightly protruded beyond the tube. Style filiform, long, much protruded. Stigma clavately capitate. Capsule crowned with the remains of the calyx, 2-celled, 2-valved, loculicidal. Placentæ attached to the dissepiment, at length free. Seeds flat, imbricated, surrounded by a reticulated wing that is bifid at the base. Embryo erect in fleshy albumen: cotyledons cordate: radicle oval.—Trees with a thick bark. Leaves petioled, coriaceous. Stipules deciduous, glandularly serrated. Flowers small, inconspicuous, greenish, pubescent, crowded and fascicled in a terminal panicle that is composed of opposite slender simple or sparingly branched peduncled racemes, the lower one or two pairs of which are subtended by a pair of opposite long-petioled convex veined dry floral leaves.

1211. (1) H. *excelsum* (Wall.:) leaves from oblong to roundish-ovate, pubescent: stipules cordate: floral leaves oblong, coloured, bullate: panicles terminal and axillary: anthers nearly sessile in the mouth of the tube of the corolla.—*Wall. in Roxb. fl. Ind.* (*ed. Wall.*) 2. *p.* 149; *DC. prod.* 4. *p.* 358; *Wight! cat. n.* 1264.—Cinchona excelsa, *Roxb. Cor.* 2. *t.* 106; *fl. Ind.* 1. *p.* 529; *Vahl in Skrift. naturh. selsk. Kiovenh.* 6. *p.* 72; *Spr. syst.* 1. *p.* 704. ——Circars; *Roxburgh.* Columala.

1212. (2) H. *obovatum* (Wall.:) leaves obovate, acuminated, glabrous: stipules ovate, acute: floral leaves lanceolate, acuminated, coloured, bullate: panicles somewhat raceme-shaped, slender, with few or no ramifications.—*Wall. in Roxb. fl. Ind.* (*ed. Wall.*) 2. *p.* 153; *L. n.* 6116; *DC. prod.* 4. *p.* 358. —Cinchona obovata, *Spr. syst. suppl. p.* 73.——Wynaad.

This we have not seen: can it be a mere variety of the preceding?

Digitized by Google

TRIBE II.—GARDENIACEÆ. *Rich.*

Ovary 2-celled, or 1-celled from the imperfection of several dissepiments; cells many-ovuled. Fruit fleshy, indehiscent, with as many cells as in the ovary, or rarely 1-celled from abortion. Seeds usually several, very rarely solitary in each cell from abortion, not winged. Albumen fleshy or cartilaginous.—Trees or shrubs. Leaves opposite, with stipules between or sometimes within the petioles.

SUBTRIBE I.—GARDENIEÆ. *DC.*

Flowers not collected on a common receptacle: fruits distinct and not concrete.

III. MUSSÆNDA. *Linn.; Gærtn. fr.* 1. *t.* 28; *Lam. ill. t.* 157.

Calyx-tube oblong-turbinate: limb 5-partite, the lobes at length deciduous, erect, acute, one of them sometimes produced into a large petioled reticulately veined coloured leaf. Corolla infundibuliform: limb 5-partite: throat villous. Anthers 5, sessile within the tube, linear, included or slightly protruded. Stigma bifid. Fruit ovoid, fleshy, not crowned with the limb of the calyx, indehiscent, 2-celled; cells many-seeded. Placentæ arising from the middle of the dissepiment, stalked, bifid and divaricating at the apex. Seeds very numerous, small, lenticularly compressed, roughish. Embryo in fleshy albumen: radicle thick, pointing towards the hilum.—Small trees or shrubs. Leaves ovate, petioled. Stipules two on each side, distinct or united at the base, acuminated. Flowers corymbose, terminal. Bracteas small, situated under the pedicels and branches of the corymb.

We omit here *M. arcuata*, Lam. (Wight! cat. n. 1265), that being without doubt a native of the Mauritius. In all the following the lobes of the corolla have a short sharp point.

1213. (1) M. *glabra* (Vahl:) leaves oval, tapering at both ends, and with the branches and corymbs nearly glabrous: segments of the calyx lanceolate-subulate, about as long as the tube, one of them in some of the flowers of each corymb produced into a large ovate acute glabrous petioled leaf: corolla pubescent on the outside: fruit glabrous, obovoid.—*Vahl, symb.* 3. *p.* 38; *DC. prod.* 4. *p.* 370; *Spr. syst.* 1. *p.* 706; *Wall.! L. n.* 6251; *Wight! cat. n.* 1266.—*Rumph. Amb.* 4. *t.* 51?

This is probably a mere variety of *M. frondosa;* we can point out no difference but the shorter segments of the calyx; the villous, pubescent, or glabrous leaves afford no character whatever.

1214. (2) M. *corymbosa* (Roxb.:) leaves oblong and the branches and corymbs glabrous: stipules cordate at the base, cuspidate at the apex: segments of the calyx subulate, glabrous, one of them in some of the axillary flowers of each corymb produced into an ovate-lanceolate leaf: style about half the length of the tube of the corolla: fruit oval.—*Roxb. fl. Ind.* 1. *p.* 556; (*ed. Wall.*) 2. *p.* 226; *DC. prod.* 4. *p.* 371; *Spr. syst. suppl. p.* 73; *Wall. L. n.* 6252.—M. frondosa, *Roxb. in E. I. C. mus. tab.* 1220.——Malabar; *Roxburgh.*

This we have not seen.

1215. (3) M. *frondosa* (Linn.:) erect, leaves oval acuminated, from villous or hirsute to nearly glabrous: branches and corymbs when young pubescent or more or less tomentose: segments of the calyx subulate, 2–4 times the length of the ovary, hirsute, one of them in some of the axillary flowers of the corymb produced into a large acute pubescent or villous leaf: corolla ex-

Digitized by Google

ternally hirsute; style the length of the tube: fruit at first hairy, afterwards nearly or quite glabrous, obovoid.—*Linn. sp. p.* 251; *Wall.! L. n.* 6250.—M. frondosa, *Linn. mant. p.* 338.—M. flavescens, *Ham. in Linn. soc. trans.* 14. *p.* 203.—α; branches tomentose; leaves harshly pubescent on the upper side, shortly and rather softly tomentose on the under; calycine leaf broadly ovate or oblong.—*Wight! cat. n.* 1267.—M. frondosa, *Vahl, symb.* 3. *p.* 37; *Willd. sp.* 1. *p.* 997; *Roxb. fl. Ind.* 1. *p.* 557; (*ed. Wall.*) 2. *p.* 227.—M. Dovinia, *Ham. l. c.*—M. Belilla, *Ham. l. c.*—*Rheed. Mal.* 2. *t.* 18.—β; branches hirsutely villous; leaves hirsute on the upper side, hirsutely villous on the under; calycine leaf oval, acuminated.—*Wight! cat. n.* 1268.—M. frondosa, *Spr. syst.* 1. *p.* 706; *Ham. l. c.*—*Burm. Zeyl. t.* 76.—γ; branches puberulous or slightly hirsute; leaves pubescent or almost quite glabrous; calycine leaf broadly ovate.—*Wight! cat. n.* 1269.—M. frondosa, *DC. prod.* 4. *p.* 370.—δ; branches from puberulous to slightly hirsute; leaves pubescent, or glabrous except on the nerves beneath; calycine leaf oblong-lanceolate.—*Wight! cat. n.* 1270.

Although variable as to pubescence, and shape of the calycine-leaf, we know that the above are mere states of one species, and we suspect that more than one-half of the whole genus enumerated in De Candolle's Prodromus ought to be reduced to it.

1216. (4) M. *tomentosa* (Wight:) branches somewhat villous: leaves oval, acuminated, hirsutely villous on both sides but particularly on the under: corymbs not much branched, villous: calycine-segments subulate, somewhat unequal, from as long to nearly twice as long as the ovary, none of them expanding into a leaf: corolla hirsute on the outside: fruit obovoid.—*Wight! in Wall.! L. n.* 6265; *cat. n.* 1271.——Gingie hills, among large masses of loose rocks.

This approaches very closely to *M. Landia*, Lam., a Mauritius plant. At times we have almost been led to doubt if our species were not a form of *M. frondosa* β, without the calycine leaf; the presence or absence of that appendage forms the principal difference between them. The flowers are white, becoming yellowish before they drop off, and have not the peculiar orange colour of *M. frondosa*.

IV. GARDENIA. *Ellis; Gærtn. fr. t.* 23, 177, 193, 194.

Calyx-tube ovate, even or ribbed: limb tubular, truncated or toothed or divided. Corolla infundibuliform or hypocrateriform: the tube much longer than the calyx: limb spreading, 5–9-partite, twisted during æstivation. Anthers 5–9, linear, nearly sessile in the throat of the corolla. Ovary with 2–7 incomplete dissepiments, and hence 1-celled. Stigma clavate, bifid, or 2-toothed; the lobes thick and erect. Berry fleshy, crowned with the limb of the calyx, internally chartaceous or with a nut, imperfectly 2–5-celled. Seeds minute, immersed in parietal fleshy placentas.—Trees or shrubs, unarmed or thorny. Leaves opposite or sometimes verticillate, oval. Flower axillary or terminal, usually solitary, white or at length often becoming yellowish, generally sweet-scented.

† 1217. (1) G. *enneandra* (Koen.:) arboreous, unarmed: leaves opposite or in threes, nearly sessile, from ovate to obovate, glabrous, with a hairy gland in the axils of the nerves on the under side: flowers terminal, 1–3 together, nearly sessile: limb of the calyx short and irregularly divided: corolla hypocrateriform; tube long, glabrous; limb 7–11 cleft, the divisions the length of the tube: berry even, nearly globose, crowned with the base of the limb of the calyx; nut thin, with 5 parietal receptacles.—G. latifolia, *Roxb. Cor.* 2. *p.* 18. *t.* 134; *fl. Ind.* 1. *p.* 706; (*ed Wall.*) 2. *p.* 552; *DC. prod.* 4. *p.* 380; *Spr. syst.* 1. *p.* 763.——Circars; *Koenig; Roxburgh.*

Digitized by Google

This we have not seen, but if Roxburgh's description be correct it cannot well be united with the following.

1218. (2) G. *latifolia* (Ait.:) arboreous, unarmed: leaves opposite or in threes, very shortly petioled, oval or obovate, glabrous, with a small hairy gland in the axils of the nerves on the under side: flowers terminal, solitary, very shortly pedicelled (pedicels scarcely a line long): limb of the calyx campanulate, irregularly divided, hirsute on the inside: corolla hypocrateriform; tube long, hirsute on the outside; limb about 9-cleft, the divisions obliquely obovate, about half the length of the tube, hirsute towards the one margin on the outside: stigma clavate, thick and fleshy, bipartite, segments bifid: berry even, nearly globose, crowned with the whole limb of the calyx; nut thin, brittle and bony, with 4 parietal receptacles.—*Ait. hort. Kew.* 1. *p.* 294; *Willd. sp.* 1. *p.* 1226; *Gærtn. fr.* 3. *p.* 78. *t.* 193. *f.* 3; *Wight! cat. n.* 1272.—*Vernac. name* Kumbay marum.——Southern provinces.

The whole limb of the calyx crowns the fruit, although ultimately by accident the segments are broken off, in which respect, and by the hirsute corolla, it differs from Roxburgh's plant. This is undoubtedly the species figured by Gærtner, and consequently of the Hortus Kewensis, Gærtner's specimens having been obtained from that establishment: we have before us specimens from the Madras herbarium, cultivated in the Missionaries' Garden, and named "*G. latifolia*, Roxb.;" these probably accord with the "Carnatic" locality given by Roxburgh.

1219. (3) G. *lucida* (Roxb.:) arborescent, unarmed, with resinous buds: leaves very shortly petioled, oblong or oval or obovate, obtuse or with a short blunt point, glabrous, hard, shining, with simple parallel nerves and connecting prominent veins: flowers somewhat terminal, solitary, rather shortly pedicelled (pedicels from ½ to an inch long): limb of the calyx with 5 long subulate divisions, sprinkled internally with erect short stout bristles: corolla hypocrateriform; tube long, glabrous, striated; limb 5-partite, divisions obovate-oblong, as long as or a little shorter than the tube, glabrous: stigma entire: berry drupaceous, even, oblong, crowned with the whole limb of the calyx; nut very hard, thick and bony, with 2 parietal receptacles.—*Roxb. fl. Ind.* 1. *p.* 707; (*ed. Wall.*) 2. *p.* 553; *in E. I. C. mus. tab.* 1542; *DC. prod.* 4. *p.* 381; *Spr. syst. suppl. p.* 85; *Wight! cat. n.* 1273.—G. resinifera, *Roth, nov. sp. p.* 150; *Spr. syst.* 1. *p.* 763.—*Pluk. t.* 367. *f.* 1?——Circars; *Roxburgh.* Columala.

The tube of the corolla is at least four times as long as the limb of the calyx in our specimens, but every other point agrees with Roxburgh's description.

1220. (4) G. *gummifera* (Linn.:) arborescent, unarmed, with resinous buds: leaves sessile, from narrow elliptic-oblong to ovate-oblong, obtuse or very shortly and bluntly pointed, puberulous and slightly scabrous when young, afterwards shining, with simple parallel nerves: flowers terminal, 1–3 together, almost sessile: calyx densely puberulous and slightly scabrous; limb short, with 5 ovate acuminated divisions: corolla hypocrateriform; tube long, slender, widened at the mouth, sparingly pubescent; limb 5-partite, segments narrow oblong, more than half the length of the tube, almost glabrous: stigma clavate, entire, striated: berry drupaceous, even, oblong, crowned with the whole limb of the calyx; nut with 4 or 5 parietal receptacles.—*Linn. f. suppl. p.* 164; *DC. prod.* 4. *p.* 381; *Spr. syst.* 1. *p.* 763; *Roxb. fl. Ind.* 1. *p.* 709; (*ed. Wall.*) 2. *p.* 556; *Roth, nov. sp. p.* 149; *Wight! cat. n.* 1274.—G. arborea, *Roxb. fl. Ind.* 1. 708; (*ed. Wall.*) 2. *p.* 555; *in E. I. C. mus. tab.* 17; *herb. Madr.!*; *DC. l. c.*——Circars; *Roxburgh.* Gingie hills.

We have followed Roth in uniting Roxburgh's *G. arborea* to *G. gummifera* of Linnæus, and we have done so on the authority of his drawing, which is a good representation of our plant, and which again is certainly that of Lin-

Digitized by Google

næus. The species alluded to by Roxburgh in the Banksian herbarium, with the divisions of the calyx "long, slender and acute," is probably a variety of *G. lucida*, Roxb.

†1221. (5) G. *calyculata* (Roxb.:) arboreous, unarmed: leaves petioled, ovate, acuminated, glabrous: flowers terminal, solitary, sessile: ovarium involucred: calyx-segments ensiform: anthers included within the swollen tube of the 5-cleft corolla.—*Roxb. fl. Ind.* 1. *p.* 704; (*ed. Wall.*) 2. *p.* 550; *DC. prod.* 4. *p.* 380.

Brought from Hydrabad to Lord Pigot, and planted in his garden at Madras; *Roxburgh.*

We are not aware that any specimens are preserved of this plant, and Roxburgh's description is too abridged to enable us to recognise it; probably it is nothing but *G. latifolia:* Sprengel refers it to *G. grandiflora*, Lour. Roxburgh places it between two species with ribbed fruit, which has induced De Candolle to refer it to the same section with them: for this however there is no authority, and had such been the structure of the fruit, we think Roxburgh would have mentioned it.

†1222. (6) G.? *pubescens* (Roth:) unarmed: leaves longish petioled, roundish oval, acuminated at both ends, the younger ones rugose, and on the under side as well as the young branches tomentose: corymbs axillary, dichotomous, divaricated: calyx minutely 5-toothed: corolla infundibuliform (small), tomentose; tube longer than the calyx: berry globose.—*Roth, nov. sp. p.* 151; *DC. prod.* 4. *p.* 383; *Spr. syst.* 1. *p.* 764.

Sent by Heyne to Roth, who has given a long description of what was of the least consequence to be known, and omitted all notice of the internal structure of the ovary and berry; the only thing certain is that it does not belong to the genus; but whether it be a *Hymenodictyon* (to which genus, after making every allowance for the terminology, it seems slightly allied), or a *Randia*, it is almost impossible to make out: of many of Roth's, it may be said with as much justice as by the late Bertero of Molina's *Rosmarinus chilensis*, that they ought to be struck out from the list of species being more correctly described under other names.

1223. (7) G. *montana* (Roxb.:) arboreous with short rigid spines: leaves oblong, obtuse, nearly sessile, with the margins revolute; upper side glabrous and shining, under a little pubescent: flowers 3–6 together, fascicled, springing from the young leafless shoots, shortly pedicelled: calyx with about 5 teeth: corolla 5–7-cleft, glabrous in the throat: anthers included: stigma bifid: berry drupaceous, roundish; nut hard and bony, with 4–6 parietal receptacles.—*Roxb. fl. Ind.* 1. *p.* 709; (*ed. Wall.*) 2. *p.* 556; *in E. I. C. mus. tab.* 16; *DC. prod.* 4. *p.* 383; *Spr. syst. suppl. p.* 84.——Circars; *Roxburgh.* Fruit about the size of a pullet's egg.

V. RANDIA. *Houst.; Lam. ill. t.* 156.

Calyx-tube obovate, limb 5-lobed or toothed. Corolla hypocrateriform: tube usually short: limb 5-partite. Anthers sessile within the throat of the corolla, oblong-linear. Stigma thick, 2-partite or 2-lobed, glabrous. Berry crowned with the calyx, somewhat dry, with a thickish rind, 2-celled. Seeds several in each cell, attached to a central placenta, either nestling in pulp or imbricated downwards, wingless. Albumen cartilaginous. "Embryo straight: radicle terete: cotyledons orbicular, flat." (*DC.*)—Small trees or shrubs, much branched. Thorns, when present, axillary, opposite, or verticillate. Leaves sessile or short petioled. Stipules solitary on both sides, the two opposite ones often united by their margins into one that is intrafoliaceous. Flowers axillary, somewhat sessile, usually solitary.

Digitized by Google

Occasionally the parts of the flower are in a senary instead of a quinary protection. De Candolle makes it an essential character of this genus to have the anthers included, although he retains in it many species, as *R. longispina*, *nutans*, *floribunda*, *longiflora*, *fasciculata*, *rigida*, *horrida*, and *sinensis*, which do not agree with that definition. The decidedly 2-celled ovary and berry easily distinguish it from *Gardenia*, but we can scarcely point any one character to separate it from *Stylocoryne*: De Candolle attributes to the latter an entire, to the other a divided stigma; but our own observations tend to the belief that almost every intermediate state may be observed in *Randia* alone. We are not inclined to place much reliance on the shape of the cotyledons and radicle, because these have been observed in only a very few species, by far too few to permit botanists to draw a general rule from them. In habit, however, the two genera are very different.—We omit *R. parviflora*, Lam., or *Gardenia Soneratii*, Spr., as from the anthers being described as longish filaments, it has no relation to either genus, and as probably it is not a native of the Peninsula.

§ 1. *Armed with spines: segments of the calyx foliaceous.*

1224. (1) R. *dumetorum* (Lam.:) spines opposite: leaves oval, somewhat obtuse, cuneate at the base, glabrous or when young slightly pubescent: flowers solitary, terminal on the young shoots, shortly pedicelled: limb of the calyx campanulate, lobes oblong: corolla hirsute on the outside; tube rather longer than the segments of the calyx, furnished on the inside near the base with a ring of erect dense hairs: fruit usually globose, rarely oblong, crowned with the limb of the calyx.—*Lam. ill. t.* 156. *f.* 4; *DC. prod.* 4. *p.* 385; *Wight! cat. n.* 1275.—Gardenia dumetorum, *Retz, obs.* 2. *p.* 14; *Roxb. Cor.* 2. *t.* 136; *Spr. syst.* 1. *p.* 762.—G. spinosa, *Linn. suppl. p.* 164.—Posoqueria dumetorum, *Roxb. fl. Ind.* 1. *p.* 713; (*ed. Wall.*) 2. *p.* 564.—Cerisicus Malabaricus, *Gærtn.* 1. *t.* 28.—*Puk. t.* 98. *f.* 6.

Most botanists, in describing this plant, have either copied from old authors, or have had before them cultivated specimens; and consequently, as may be expected, there is a greater similarity between the characters than is warranted by the species in a wild state. The calyx is either quite glabrous or slightly hirsute; the whole limb is permanent (not merely the tubular portion, as Roxburgh says) unless broken accidentally. The size of the fruit varies from that of a small cherry to as large as a walnut. The whole habit of the plant is likewise extremely variable, according as it grows in a poor or rich soil.

† 1225. (2) R. *nutans* (DC.:) spines opposite, horizontal: young branches long, drooping, pubescent: leaves from cuneiform-oblong to round, glabrous: flowers short pedicelled, at the extremity of short leafless or few-leaved axillary young shoots: calyx with a short rather hairy cylindric tube: corolla silky on the outside; tube scarcely longer than the calyx-segments, with a dense circle of white hairs internally near the base: fruit globose, crowned with the whole limb of the calyx.—*DC. prod.* 4. *p.* 386.—Posoqueria nutans, *Roxb. fl. Ind.* 1. *p.* 714; (*ed. Wall.*) 2. *p.* 565.—Gardenia nutans, *Roxb. hort. Bengh. p.* 15; *Spr. syst. suppl. p.* 84.

Roxburgh does not give any locality for this either in the Flora Indica, or Hortus Benghalensis; the presumption therefore is, that the species is merely taken up from some cultivated plant in the Calcutta Bot. Garden. We do not see how it differs in the slightest degree from some states of the preceding. Roxburgh says that the calyx tube and lobes are all permanent, and consequently that the fruit is crowned with the whole or entire calyx; De Candolle has therefore surely misapprehended the meaning of the passage when he says "bacca calycis tubo tum *integro* coronata."

† 1226. (3) R. *Rottleri* (W. & A.:) shrubby, with short slender spines: leaves elliptic, acute at both ends: flowers sessile, solitary, terminal: segments of the calyx obtuse, and its tube glabrous.—Gardenia stipularis, *Rottl. and Willd. in act. am. nat. cur. Berol.* 4. 1803. *p.* 182; *DC. prod.* 4. *p.* 383.

Apparently very closely allied to the preceding in the structure of the calyx, but differing by the leaves acute at both ends.

Digitized by Google

1227. (4) R. *longispina* (DC.:) spines opposite or occasionally alternate, horizontal: young branches drooping: leaves from obovate to oblong, cuneate at the base, glabrous, or pubescent on the nerves: flowers shortly pedicelled, generally 1–3 at the extremities of the young short axillary shoots, occasionally solitary and axillary: limb of the calyx campanulate, lobes ovate, with often a small tooth between them in the sinus: corolla silky on the outside; tube rather longer than the segments of the calyx, with a dense ring of hairs near the base on the inside: fruit drupaceous, short-ovoid and slightly retuse at the base, crowned with the permanent limb of the calyx.—*α, culta;* tube of the calyx and ovary glabrous.—R. longispina, *DC. prod.* 4. *p.* 386.—Posoqueria longispina, *Roxb. fl. Ind.* 1. *p.* 716; (*ed. Wall.*) 2. *p.* 566.—Gardenia longispina, *Roxb. hort. Bengh. p.* 15; *in E. I. C. mus. tab.* 1379; *Spr. syst. suppl. p.* 84.—*β, sylvestris;* tube of the calyx and ovarium more or less hairy. —*Wight! cat. n.* 1276.

Roxburgh states the fruit to be obovate, and this is copied by other authors without examination; but in his drawing, above referred to, the mature fruit is represented ovate and thickest at the base, as in our specimens. Roxburgh was only acquainted with the plant in a state of cultivation, as may be easily proved by the high number attached to his drawing: in a wild state the spines are often so small as to render the specific name quite inapplicable. We are inclined to refer here specimens from Heyne in Rottler's herbarium marked *Gardenia spinosa*, on account of the size of the foliage, but they are not in fruit. Probably *Canthium chinense*, Pers. (*Gardenia spinosa*, Thunb. and Willd.) is our var. *β*; the Madras locality however given by Roemer and Schultes, and De Candolle, belongs to the *Gard. spinosa* of Linnæus.

1228. (5) R. *tomentosa* (W. & A.:) spines opposite, spreading: branches glabrous: leaves on the young short shoots, petioled, oval, obtuse, more or less cuneate at the base; upper surface thinly and hispidly pubescent, tomentose on the nerves; under, and the petioles, tomentose: flowers solitary at the extremities of the leafy shoots, shortly pedicelled: fruit nearly globose, slightly 10-ribbed, villous or when ripe more glabrous, crowned with the tubular portion of the limb of the calyx and the remains of its ovate segments. —*Wight! cat. n.* 1277.

1229. (6) R. *floribunda* (DC.:) spines axillary, rigid: leaves opposite and fascicled, obovate, cuneate at the base, glabrous: flowers shortly pedicelled, 4–6 on each of the small lateral scaly leafless young shoots: calyx glabrous; tube cylindric, segments of the limb somewhat lanceolate, acuminated, persistent: corolla silky on the outside; tube rather shorter than the segments of the calyx, with a circle of erect hairs about the middle on the inside; fruit ovate-cordate, shining, crowned with the limb of the calyx.—*DC. prod.* 4. *p.* 386.—Posoqueria floribunda, *Roxb. fl. Ind.* 1. *p.* 719; (*ed. Wall.*) 2. *p.* 569.—Gardenia floribunda, *Spr. syst. suppl. p.* 84.

§ 2. *Armed with spines: limb of the calyx toothed.*

1230. (7) R. *uliginosa* (DC.:) arboreous, armed: branches straight, 4-angled; branchlets decussating, horizontal, terete, bearing 1–4 thorns and 1–3 short-pedicellate flowers at their extremity: leaves short-petioled, oblong, somewhat cuneate at the base, glabrous, shining: limb of the calyx tubular, bluntly 5-toothed or nearly quite entire, a little shorter than the tube of the corolla: corolla villous in the mouth: berry oval, drupaceous, even.—*DC. prod.* 4. *p.* 386.—Gardenia uliginosa, *Retz, obs.* 2. *p.* 14; *Spr. syst.* 1. *p.* 762; *Roxb. Cor.* 2. *t.* 135.—Posoqueria uliginosa, *Roxb. fl. Ind.* 1. *p.* 712; (*ed. Wall.*) 2. *p.* 563.

* 1231. (8) R. *foliolosa* (W. & A.:) shrubby, armed with spreading opposite rigid spines: leaves small, fascicled on small lateral knobs (abortive branches), oblong or obovate, obtuse, cuneate at the base, nearly sessile,

Digitized by Google

scarcely longer than the spines, very glabrous: flowers small, solitary and sessile on the apex of the lateral knobs, glabrous: calyx-limb somewhat truncated, with 6 minute sharp and slightly recurved teeth: tube of the corolla scarcely twice the length of the limb of the calyx, the inside villous at the mouth.—*Wight! cat. n.* 1278.—Gardenia foliolosa, *herb. Madr.!*

We do not know whence this species was obtained; our specimens are from Klein's herbarium, and were cultivated in the Missionaries' Garden; they are without fruit.

§ 3. *Unarmed.*

1232. (9) R. *corymbosa* (W. & A.:) unarmed: leaves long-petioled, oblong-obovate, cuneate at the base; when young with the upper side pubescent, and the under as well as the petioles velvetty: flowers in a slightly branched terminal sessile corymb: calyx almost glabrous, its limb campanulate, minutely 5-toothed: corolla externally hirsute.—*Wight! cat. n.* 1279.

May Roth's *Gardenia pubescens* be this species? We have only one specimen before us, and it exhibits no appearance of thorns; we have not seen the fruit.

1233. (10) R. *Candolleana* (W. & A.:) unarmed: leaves long-petioled, roundish-obovate, obtuse, cuneate and tapering at the base, glabrous on both sides: flowers in a small terminal sessile very slightly branched corymb: calyx glabrous; its limb campanulate, nearly truncated, with 5 small acute deciduous teeth: fruit globose.—*Wight! cat. n.* 1280.

The limb of the calyx, when the fruit advances towards maturity, appears, from various causes, to be more or less completely broken off.

VI. HYPTIANTHERA. *W. & A.*

Calyx-tube short, obovate: limb deeply 5-cleft; segments oblong, acuminated. Corolla rotate: tube very short, hairy on the inside: limb 5-partite, spreading, in æstivation twisted. Stamens 5: filaments wanting: anthers oblong, large, attached by the back above the middle to the top of the tube of the corolla, free at the base and apex. Ovary crowned with a thick fleshy disk, 2-celled, with about 6 suspended ovules in each cell. Style very short, perforating the disk. Stigma hirsute, large, oblong, 2-partite, segments erect, close together and never diverging. Berry globose, crowned with the persistent limb of the calyx, 2-celled, with few seeds imbricated in two rows in each cell.—Shrubby, unarmed, glabrous. Leaves short-petioled, oblong-lanceolate, acuminated, cuneate at the base. Stipules interpetiolar, entire, solitary on each side, triangular, acuminated, rigid, adpressed. Flowers bracteated, small, collected into small dense globose sessile fascicles in the axils of the leaves. Fruit about the size of a pea.

1234. (1) H. *stricta* (W. & A.)—*Wight! cat. n.* 1281.—Randia stricta, *Roxb. fl. Ind.* 1. *p.* 526; *(ed. Wall.)* 2. *p.* 145; *DC. prod.* 4. *p.* 386.—Macrocnemum strictum, *Roxb. in E. I. C. mus. tab.* 1029; *Roem. and Schult. syst.* 5. *p.* 6; *Smith in Rees' cycl.*—Rondeletia stricta, *Roth, nov. sp. p.* 140 (excl. syn.); *Roem. and Sch. l. c. p.* 234; *Spr. syst.* 1. *p.* 707.

The figure by Plukenet (t. 132. f. 6.) referred to by Roth, might at first sight be taken for a reduced one of this plant, but is undoubtedly *Elatine (Bergia) verticillata*: we do not comprehend why De Candolle seems disposed to refer it to *Zizyphus*.

VII. GRIFFITHIA. *W. & A.*

Calyx-tube obovate, short: limb campanulate, 5-toothed, deciduous. Corolla infundibuliform, hairy in the throat: limb spreading, 5-partite; seg-

Digitized by Google

ments narrow-oblong, acute, about as long as the tube, in æstivation slightly twisted. Stamens 5: anthers long, linear, acuminated, exserted, attached by their back a little above their base to the mouth of the tube of the corolla: the filaments scarcely any, much shorter than the part of the anther below the point of attachment. Ovary crowned with a thickish fleshy disk, 2-celled, with several ovules in each cell. Style filiform the length of the tube of the corolla. Stigma entire, long, fusiform, striated, exserted. Berry globose, marked on the apex with a circular scar where the limb of the calyx has fallen off, 2-celled, with 8–10 seeds in each cell. Seeds angled, pretty large, surrounded with mucilage. Albumen cartilaginous. Embryo as long as the albumen.—A rigid glabrous shrub, with usually opposite thorns, sometimes unarmed. Leaves petioled, from obovate to oblong, cuneate at the base, coriaceous, with concave glands that are hairy on the margin in the axils of the nerves. Stipules interpetiolar, solitary on each side, distinct, roundish-ovate with a cuspidate point, caducous. Flowers pedicelled (white), in a nearly simple very shortly peduncled umbel-like corymb, at the ends of the branches, or on short lateral knobs or leafless young shoots: pedicels bibracteated near the base. Fruit about the size of a large pea, reddish.

Easily recognised from most genera of the section by the decidedly deciduous limb of the calyx, which, soon after the flowering is over, separates by a transverse crack from the apex of the ovary. It has little affinity, so far as habit goes, with *Stylocoryne*, in which De Candolle places it, but much more with *Randia*. We have named it in honour of Mr Griffith, an able young botanist, now on the Madras establishment.

1235. (1) G. *fragrans* (W. & A.)—*Wight! cat. n.* 1282.—Gardenia fragrans, *Koen.*; *Roxb. Cor.* 2. *t.* 197; *Roth, nov. sp. p.* 150; *Spr. syst.* 1. *p.* 762.—G. Pandaki, *Vahl.*—Posoqueria fragrans, *Roxb. fl. Ind.* 1. *p.* 717; (*ed. Wall.*) 2. *p.* 567.—Randia Malabarica, *Lam. enc. meth.* 3. *p.* 25.—Stylocoryne Pandaki, *DC. prod.* 4. *p.* 377.—S. Malabarica, *DC. l. c.*—*Rheed. Mal.* 5. *t.* 35 (not good).

There can be no doubt but this shrub, which is very common and widely distributed in the Peninsula, is what Rheede has figured; but the description, with the exception of the colour of the flowers, which only appear purple in the dry state, is better than the plate.

VIII. STYLOCORYNE. *Cav.; Gærtn. fr.* 3. *t.* 197.—Webera, *Schreb.*—Chomelia, *Linn.* (not *Jacq.*)—Cupia, *DC.* (partly).—Tarenna, *Gærtn. fr.* 1. *t.* 28.

Calyx-tube turbinate: limb 5-cleft or 5-toothed, persistent. Corolla hypocrateriform or infundibuliform: tube longer than the limb of the calyx: limb 5-partite; segments spreading or recurved. Stamens 5: filaments very short or almost wanting: anthers long, linear, exserted. Ovary 2-celled, with two or more ovules in each cell. Style filiform. Stigma much exserted, thick, elongated, fusiform or somewhat clavate, undivided. Berry globose, 2-celled, or rarely by abortion 1-celled, crowned with the limb of the calyx. Seeds peritropal, usually angled and either few or numerous in each cell, rarely from abortion solitary and not angled. Albumen between fleshy and cartilaginous. Radicle cylindric. Cotyledons flat, foliaceous, small.—Trees or shrubs, unarmed. Leaves oblong-lanceolate, petioled. Stipules interfoliaceous, solitary on each side, the opposite ones usually (perhaps always) united together, broad at the base, with a sharp point. Flowers white, in terminal or axillary corymbs or cymes.

Digitized by Google

We follow Richard in uniting *Cupia* to *Stylocoryne*; the habit of the two genera is quite the same, and even according to the characters (the tubular and 5-toothed, or the 5-partite limbs of the calyx) given by De Candolle, several of what he has placed in *Cupia* ought to have been removed to *Stylocoryne*: thus his *C. densiflora* and *C. odorata* have the limb of the calyx tubular and 5-toothed, and differ in that respect from *Cupia*. *C. oppositifolia* is scarcely known, and does not appear to belong to the genus; perhaps indeed the leaves are alternate, and in that case it must be removed from the order. We exclude *C. auriculata* and *C. scandens* of De Candolle, which appear to be more allied to *Randia*; and also *C. truncata*, which, from its twining habit, the ovary with 2 ovules in each cell, its annular truncate and obscurely 5-toothed limb to the calyx, and lobes of the corolla with hooked points, seems to form a distinct genus near *Diplospora*. *C. cymosa*, DC. is the same as *Canthium didymum*, Gærtn., and *Psydrax dicoccos*, Gærtn.: *C. thrysoidea*, DC., belongs to *Wendlandia*. —As we agree with those who reduce the genus *Webera* among the mosses to a section of *Bryum*, we ought perhaps to have adopted that name here, instead of *Stylocoryne*, but have not done so in order to prevent confusion, and in deference to those who differ from us about what ought to constitute a genus of *Musci*.

1236. (1) S. *Webera* (A. Rich.:) shrubby, glabrous: leaves lanceolate-oblong, shining: corymbs trichotomous, terminal: calyx-limb 5-cleft: tube of the corolla short, about twice the length of the calyx-tube, slightly widened and bearded at the mouth; segments of the limb recurved, oblong, villous at their base along the middle, about twice as long as the tube: style slightly hairy; stigma with 10 longitudinal somewhat winged angles: berry 2-celled, with 4–8 seeds in each cell.—*Rich. in mem. soc. hist. nat. Par.* 5. *p.* 248; *Wight! cat. n.* 1283.—Webera corymbosa, *Willd. sp.* 1. *p.* 1224; *Spr. syst.* 1. *p.* 759; *Roxb. fl. Ind.* 1. *p.* 696; *(ed. Wall.)* 2. *p.* 533.—Canthium corymbosum, *Pers. syn.* 1. *p.* 200.—Rondeletia Asiatica, *Linn. sp. p.* 244.—Cupia corymbosa, *DC. prod.* 4. *p.* 394.—Gardenia Pavetta, *Roxb. in E. I. C. mus. tab.* 144.—Tarenna Zeylanica, *Gærtn. fr.* 1. *p.* 139. *t.* 28; *DC. l. c. p.* 395.—Polyozus Maderaspatana, *DC. l. c. p.* 495.—Pavetta Wightiana, *Wall.! L. n.* 6167.—Ixora alba, *Herb. Sm.* (not in *Rees' cycl.*)—*Rheed. Mal.* 2. *t.* 23; *Pluk. t.* 171. *f.* 3 (bad).

The flowers are almost always cleft in a quinary manner, but occasionally some may be observed with 6 or rarely with only 4 divisions: specimens of the last have been figured by Gærtner as his *Terenna* (the Cinghalese name is *Tarana* not *Tarenna*), which is otherwise an excellent representation of the fruit of our plant. The young shoots are frequently covered over with a resinous exudation, whence probably *Webera cerifera*, Moon (cat. Ceyl. pl. p. 19), ought to be added to the above synonyms.

1237. (2) S. *monosperma* (W. & A.:) shrubby, glabrous: leaves lanceolate-oblong, shining: corymbs trichotomous, with rather few flowers, terminal: calyx-limb cupulate, minutely 5-toothed: tube of the corolla elongated, infundibuliform, many times longer than the limb of the calyx, pubescent on the inside; segments of the limb oblong, glabrous, about half the length of the tube: ovary with 2–3 ovules in each cell: style slightly hairy; stigma acute, compressed, with a furrow along each side: berry (white and about the size of a small cherry) fleshy, 1-celled, 1-seeded; seed not angled.—*Wight! cat. n.* 1284.

TRIBE III. HEDYOTIDEÆ. *Cham. and Schl.*

Ovary 2-celled; cells many ovuled. Fruit capsular, 2-celled, usually loculicidal, rarely septicidal, sometimes somewhat membranaceous and indehiscent. Seeds several in each cell (rarely solitary or in pairs when the capsule is loculicidal), not winged. Albumen fleshy.—Trees, shrubs, or herbaceous plants. Leaves opposite or in threes. Stipules interpetiolar.

Digitized by Google

SUBTRIBE I. RONDELETIEÆ. *DC.*

Stipules solitary or 2 on both sides, free from the petioles, and neither forming with them a sheath not split into bristle-shaped segments. Segments of the corolla more or less twisted in æstivation. Stamens 5, (except in *Bikkia*, *Greenea*, and some species of *Rondeletia*.)

IX. WENDLANDIA. *Bartl.; DC.* (partly).

Calyx-tube somewhat globose, often striated: the limb very short, composed of 5 small persistent teeth. Corolla with the tube longer than the calyx, widest at the throat, glabrous or nearly so on the outside: limb spreading, 5-lobed; the lobes oblong or lanceolate, acute or obtuse, imbricated and slightly twisted in æstivation, and forming a globose or oval head to the flower-bud. Stamens 5: filaments springing from the very top of the tube, often very short: anthers oblong, exserted, oscillatory. Ovary crowned with a fleshy disk. Style exserted, filiform. Stigma of two pretty large, oval, thickish segments. Capsule globose, crowned with the limb of the calyx, 2-celled, splitting at the apex, loculicidal. Seeds minute, numerous in each cell.—Trees or shrubs. Leaves coriaceous, oval or lanceolate, petioled. Stipules solitary on each side, broad at the base, acuminated. Panicles thyrsoid, terminal, many-flowered. Flowers white, small, very shortly pedicelled, forming spikes or fascicles along the ultimate ramifications of the panicle.

Of the pentandrous species enumerated by De Candolle, *W. longifolia* now forms the genus *Adenosacme* of Wallich: all the tetrandrous ones must be likewise excluded. Dr Wallich remarks, that most of the species of this genus "vary considerably in the figure and size of the leaves, the degree of their pubescence, and in their inflorescence; a circumstance which renders their specific discrimination difficult:" in which we find an additional proof of what we have had occasion to urge more than once in this volume, that pubescence and shape of leaves being dependent on adventitious circumstances, afford characters that are frequently of little importance unless supported by others of greater weight.—With regard to the species in Dr Wallich's List, we have only had an opportunity of examining a few of them: of these *W. paniculata*, Wall. L. n. 6266. *b*, is certainly not *Rond. paniculata*, Roxb. (in E. I. C. mus. tab. 1954); if not a new species (*W. budleioides*, Wall. mst.) it might be united with *W. tinctoria* (*Rondeletia tinctoria*, Roxb. l. c. tab. 1955): *W. tinctoria*, Wall. L. n. 6269. *b*, has the anthers too much exserted for the true plant; we propose to call it *W. Wallichii*: *W. cinerea*, Wall. L. n. 6268 (*Rondeletia cinerea*, Wall.), does not appear to be distinguishable as a species from *W. exserta*: *W. puberula*, DC., is described with the stigma clavate, but it is composed of two thickish plates or lobes as in the other species; does this really differ from *W. pendula*, which Dr Wallich describes with an entire stigma?

1238. (1) W. *exserta* (DC.:) arboreous, with villous young branches: leaves petioled, oblong-lanceolate, upper side pubescent, under velvetty, glaucous: stipules acute, densely pubescent, the upper part recurved, reniform: branches of the panicle villous, spreading: flowers more or less crowded: calyx hoary: corolla scarcely pubescent; tube very short, scarcely exceeding the limb of the calyx, somewhat campanulate; divisions of the limb recurved: filaments nearly as long as the segments of the corolla: capsule villous.—*DC. prod.* 4. *p.* 411; *Wall. L. n.* 6267.—Rondeletia exserta, *Roxb. fl. Ind.* 1. *p.* 523; (*ed. Wall.*) 2. *p.* 135; *in E. I. C. mus. tab.* 1363.—R. thrysiflora, *Heyne in Roth, nov. sp. p.* 141; *Spr. syst.* 1. *p.* 708.—R. Oryssensis, *Roth, l. c. p.* 142; *Spr. l. c.*—R. Heynei, *Roem. and Schult. syst.* 5. *p.* 234.

We have already remarked that *W. cinerea* is too closely allied to this species; the only difference we know of between the two is, that in *W. cinerea* the stipules are usually blunt; but we have also observed them mucronate in specimens from Dr Wallich himself. We also suspect *W. proxima*, DC., or *Rond. proxima*, Don, to be quite the same, or at most a mere variation with

Digitized by Google

the tube of the corolla a little longer than usual: in this we are confirmed by the circumstance that the only species with tomentose leaves enumerated by Dr Wallich (by whom it was transmitted), both in the Flora Indica and in his List, are *W. cinerea* and *exserta*.

1239. (2) W. *Notoniana* (Wall.:) arboreous, with the young shoots hirsute: leaves petioled, oblong, slightly tapering at both ends; upper side glabrous, under somewhat glaucous, more or less minutely pubescent, often nearly quite glabrous except on the nerves and veins: stipules triangular-ovate, hirsute at the base; the upper part glabrous, recurved: branches of the panicle hirsute, somewhat erect: flowers crowded and forming interrupted spikes: calyx hoary, the teeth triangular, acuminated: corolla glabrous, 6–8 times longer than the limb of the calyx; tube widened at the mouth; divisions of the limb oval, obtuse, recurved: anthers nearly sessile: capsule sprinkled with short hairs.—*Wall.! L. n.* 6273; *Wight! cat. n.* 1285.—Webera, *herb. Madr.!*—W. thrysoidea, *Roth, nov. sp. p.* 149; *Spr. syst.* 1. *p.* 759. —Canthium thrysoideum, *Roem. and Schult. syst.* 5. *p.* 207.——Cupia thrysoidea, *DC. prod.* 4. *p.* 394.——Neelgherries. Dindygul hills. Mysore; *Heyne.*

We have before us a specimen from Nundydroog in Mysore exactly agreeing with Roth's description; but although the panicle be occasionally contracted into an ovate thryse not exceeding an inch and half in length, it is much larger when the specimens are fine and in fruit, being then often 6 or 8 inches long. The leaves vary considerably in pubescence, and frequently form a verticil of three towards the extremities of the vigorous flower-bearing branches. From the imperfect character given of *W. densiflora* from Java, we scarcely know whether it be the same or not as this species.

*1240. (3) W. *bicuspidata* (W. & A.:) arboreous: young branches hirsutely pubescent: leaves petioled, obovate, bluntly pointed, cuneate at the base, pubescent on the nerves on the under side, but otherwise glabrous: stipules broadly triangular at the base, with a 2-cleft point, hirsute except along the margins: petioles and spreading branches of the lax panicle densely pubescent: flowers solitary or in threes, approximated but not crowded: calyx glabrous; teeth ovate: corolla glabrous, 6–8 times longer than the limb of the calyx; limb small: anthers nearly sessile: capsule glabrous.

The specimen before us is from Ceylon, but it is probably also found in the southern districts of the Peninsula.

1241. (4) W. *Heyneana* (Wall.:) young branches, petioles, and branches of the panicle, covered with a very minute somewhat velvetty pubescence: leaves oblong, tapering at both ends, glabrous on both sides: stipules triangular, cuspidate, entire, glabrous, slightly hairy on the margin: panicle somewhat contracted: flowers solitary or in threes, approximated but not crowded: calyx glabrous; teeth minute, roundish: corolla glabrous, 6–8 times longer than the limb of the calyx: anthers nearly sessile: capsule glabrous.—*Wall.! L. n.* 6274.

Our character is taken from a specimen from Dr Wallich in Dr Hooker's herbarium: we can scarcely point out how it differs from *W. glabrata*, DC.

X. GREENEA. *W. & A.*

Calyx-tube globose: limb of 4 lanceolate, erect teeth as long as the tube. Flower-bud clavate. Corolla infundibuliform, pubescent, several times longer than the limb of the calyx: tube naked in the mouth: limb 4-cleft; segments ovate, acute, small, twisted in æstivation. Stamens 4: filaments almost wanting: anthers attached by the middle of their back to below the mouth of the corolla, linear, bifid at both ends, their apices only exserted. Ovary crowned with a thick fleshy disk: placentæ thick and fleshy, hemispherical,

Digitized by Google

attached to the middle of the dissepiment. Style filiform, soon projecting beyond the corolla. Stigma bipartite; segments narrow, linear, recurved. Capsule crowned with the calycine teeth (the apex circular, flat, and not free from the calyx), 2-celled, septicidal, bicoccous; the cocci splitting at the apex at the back, separating from the epicarp (the calyx). Seeds numerous in each cell, minute, angular.—Shrubs. Leaves elliptic, acuminated, much attenuated at the base. Stipules large, tongue-shaped, membranaceous. Corymbs terminal, trichotomous, spreading: branches hirsutely pubescent: partial ones dichotomous. Flowers whitish, nearly sessile along the one side of the ultimate divisions of the panicle, approximated, each subtended by a subulate bractea. Calyx sprinkled with short bristly hairs.

To this very distinct genus (which we have named in honour of B. D. Greene, Esq. of Boston, U. S.), besides the following, belongs *Rondeletia spicata*, Wall., or *R. corymbosa*, Jack, which are placed in *Wendlandia* by De Candolle, and through inadvertency kept up as distinct species, although Dr Wallich points out their identity in his edition of the Flora Indica (vol. ii. p. 574): as both specific names are applicable to the whole genus, we trust we shall not be charged with recklessly altering them by proposing for this species that of *G. Jackii*. The inflorescence is very peculiar, and considerably like that of *Tournefortia*.

1242. (1) G. *Wightiana* (W. & A.:) leaves almost quite glabrous on both sides except on the midrib and nerves.—*Wight! cat. n.* 1286.—Wendlandia Wightiana, *Wall.! L. n.* 6277.

XI. OPHIORRHIZA. *Linn.; Gærtn. fr.* 1. *t.* 55.

Calyx-tube short, turbinate: limb 5-cleft, persistent. Corolla tubular, infundibuliform; tube several times longer than the limb of the calyx, hairy within; limb of 5 ovate lobes. Stamens 5, included. Ovary adnate to the calyx, crowned with a 2-lobed disk, 2-celled, many-ovuled; placentæ oblong, ascending from the dissepiment near the bottom of each cell. Style filiform, usually short. Stigma bifid. Capsule compressed, broad, 2-lobed, crowned with the calycine segments, 2-celled, 2-valved, loculicidal. Seeds numerous, small, somewhat hexagonal. Embryo straight in the axis of a fleshy or somewhat horny albumen.—Low perennial, herbaceous, or suffrutescent plants. Leaves opposite, petioled, membranaceous, the opposite one often smaller. Stipules in pairs on each side, very small, and deciduous. Peduncles axillary and terminal, cymose at the apex, with the ultimate divisions somewhat umbellate. Flowers unilateral, nearly sessile.

1243. (1) O. *Munghos* (Linn.:) stem when old suffruticose: leaves elliptic-lanceolate, acuminated at both ends, glabrous, very thin: stipules minute, truncated: cymes peduncled, terminal, branched, naked: tube of the corolla short, infundibuliform: style as long as the tube.—*DC. prod.* 4. *p.* 415; *Spr. syst.* 1. *p.* 585; *Gærtn. fr.* 1. *t.* 55; *Roxb. fl. Ind.* 1. *p.* 701; (*ed. Wall.*) 2. *p.* 544; *in E. I. C. mus. tab.* 1212; *Wall.! L. n.* 6277; *Wight! cat. n.* 1287. —*α*; cymes lax; their ultimate branches elongated, many-flowered.—*β*; cymes small, corymbiform, their branches short and few-flowered.—*γ*; cymes small, dense, somewhat capitate, their branches short and few-flowered.—— Dindygul. Courtallum. Travancore.

1244. (2) O. *Brunonis* (W. & A.:) stem suffruticose: leaves oblong-lanceolate, attenuated at both ends, glabrous, very thin: stipules minute, acute: cymes peduncled, terminal or axillary, somewhat corymbiform, branched; ultimate divisions few- (usually 2-) flowered: bracteas long, linear-subulate, scattered on the peduncle, and at the base of the partial peduncles, and oc-

Digitized by Google

casionally also of the pedicels: tube of the corolla shortish, nearly cylindric: style protruded.—*Wight! cat. n.* 1288.

Closely allied, on account of the bracteas, to *O. bracteolata*, Br. in Wall.! L. 6228 (*O. Munghos* var. *Nepalensis*, DC.), and *O. rugosa*, Wall.!; but both of these are herbaceous, and have the corolla twice or thrice as long as our species.

†1245. (3) O. *Harrisiana* (Heyne.)—*Wall. L. n.* 6236.

SUBTRIBE II. HEDYOTEÆ. *DC.*

Stipules cohering with the petioles on both sides, and forming with them a more or less distinct sheath that is usually split into several bristles. Segments of the corolla imbricated in æstivation. Stamens 4 (except in *Dentella*).

XII. DENTELLA. *Forst.; Lam. ill. t.* 118.

Calyx-tube globose: limb 5-cleft; segments lanceolate, acute. Corolla infundibuliform; tube 2–3 times longer than the limb of the calyx, slightly hairy on the inside near the base: limb 5-cleft, spreading; segments ovate, acute, with an acute tooth on each side above the middle. Stamens 5: filaments very short, inserted a little above the base of the tube: anthers oblong, not reaching above the middle of the tube. Style very short. Stigmas 2, long, narrow-linear, slightly spreading. Capsule (or dry berry) scarcely dehiscent, between globose and ovate, hirsutely villous, crowned with the permanent limb of the calyx, 2-celled. Placentæ fleshy, hemispherical, adnate to the middle of the dissepiment. Seeds numerous in each cell, minute, angled.—Herbaceous, annual, tufted, creeping plants, growing in wettish situations, as on the banks of water-courses. Stems filiform, branched, glabrous. Leaves oblong, attenuated at the base, glabrous, or with the petioles ciliated at the base. Flowers white, small and very tender, axillary, solitary, alternate, very shortly pedicelled.

D. erecta of Roth (nov. sp. p. 140), having alternate leaves, must obviously be removed from the family. Chamisso and Schlechtendal (in Linnæa, 4. p. 151) describe it with the calyx free from the fruit, but do not mention the natural order to which it belongs: these specimens, however, are probably in a bad state, for in those before us the ovary certainly coheres with the calyx. The plant is truly a species of *Wahlenbergia* (*W. perotifolia*, W. & A.), not noticed, so far as we can ascertain, by M. Alph. De Candolle, or by Dr Wallich, although sent to the latter by Dr Wight.

1246. (1) D. *repens* (Forst.)—*DC. prod.* 4. *p.* 419; *Spr. syst.* 1 *p.* 707; *Roth, nov. sp. p.* 139; *Cham. and Schl. in Linnæa*, 4. *p.* 150; *Roxb. fl. Ind.* 1. *p.* 532; *(ed. Wall.)* 2. *p.* 159; *Wall.! L. n.* 6206; *Wight! cat. n.* 1289.—Oldenlandia repens, *Linn. mant. p.* 40. (not *Burm.*); *Roxb. in E. I. C. mus. tab.* 545.—Hedyotis repens, *Lam.—Rumph. Amb.* 6. *t.* 170. *f.* 4; *Rheed. Mal.* 9. *t.* 39. (bad).

De Candolle mentions that *Old. repens* of Burman (fl. Ind. t. 15. f. 2), on the authority of his herbarium, is *Peplis portula;* but although this be true of the specimen, we suspect, from the reference to Plukenet, and the locality, that the figure and specific character belongs to *Hedyotis serpyllifolia*, Poir.: *Peplis Portula* is not found in the Peninsula.

XIII. HEDYOTIS. *Linn.; Lam. ill. t.* 62; *Brown; Wall.*

Calyx-tube ovate or globose: limb 4-toothed or 4-cleft, the teeth or segments persistent, without smaller intermediate ones. Corolla somewhat regular, infundibuliform, tubular, or rotate, 4-cleft, the segments imbricated (not twisted) in æstivation. Stamens 4, inserted into the mouth of the

Digitized by Google

tube, or a little below it: anthers roundish, oblong, or short-linear. Ovary crowned with a fleshy disk. Style filiform. Stigma bifid or 2-lobed, rarely entire. Capsule obovate, ovate or globose, crowned with the limb of the calyx, 2-celled, dehiscing at the apex within the calyx in a direction transverse to the dissepiment, at length sometimes splitting to the middle or to the base, and either loculicidal or septicidal. Seeds usually minute, numerous and angled, rarely few or solitary in each cell.—Herbaceous, suffrutescent, or shrubby plants. Stems 4-angled or terete: branches sometimes compressed. Stipules cohering with the petioles, usually fringed with several bristles, rarely entire. Inflorescence various.

This may well be called a polymorphous genus, and not in habit only, but also in characters. Chamisso and Schlechtendal, and De Candolle, have lopped off portions, but in several instances the distinctive marks proposed, if attended to in practice, which they are certainly not in De Candolle's prodromus, although the best and last enumeration of the species, would remove plants, otherwise very closely allied, to a distance. We shall therefore follow Brown and Wallich, by retaining the genus entire, and even add to it one species which, if the number of seeds afforded a sufficient character, would be rather placed near *Spermacoce*, but which is a *Hedyotis* in its mode of dehiscence and almost all its other characters. *Houstonia*, having stipules, and an adherent or at all events a half adherent ovary, belongs to this compound genus, as has been already remarked by St Hilaire: nor do we well understand why all the other French botanists ascribe to it a free ovary, and thus remove it to the *Gentianeæ*.—We have divided the genus into perhaps too many sections; we have done so for the sake of pointing out the structure of the flower or fruit of the different species, in order that, when the others which do not fall within our notice are examined with the same minuteness, the genus may be divided with more rigorous and definite characters than have hitherto been presented.

SECT. 1. Calyx-segments with the sinus somewhat obtuse. Corolla infundibuliform, hairy in the throat and on the lower part of the lobes: tube a little longer than the limb of the calyx, wide at the mouth: lobes oblong, about the length of the tube, or shorter. Anthers oblong-linear, exserted. Ovary with the placentas oblong and ascending. Capsule with the apex more or less 4-lobed and slightly produced beyond the calyx-tube, at length septicidal, splitting to the base into two somewhat bony cocci. Seeds numerous, minute, angled.—Shrubs or suffrutescent plants. Stipules ovate, pointed, with usually several filiform teeth along the margins. Flowers in panicled or corymbiform thryses, terminal and from the upper axils, rarely in sessile, terminal or axillary capituli.—*Diplophragma*.*

* Closely allied are two other groups, neither of which occur in the Peninsula:—

1. *Macrandria*. Calyx-limb 4-partite: segments oblong-lanceolate, recurved, the sinus somewhat rounded. Corolla widely infundibuliform, papery, much bearded on the throat and along the segments: tube very short, not half so long as the segments of the calyx: limb deeply 4-cleft: segments linear. Filaments at length long (much longer than the corolla), filiform: anthers oblong-linear. Ovary crowned with a tuft of numerous erect short bristles. Style exserted, shorter than the stamens, hairy. Capsule globose, somewhat 4-lobed at the apex, protruded slightly beyond the calyx, bicoccous; the cocci crustaceous, open on their inner face, splitting from the apex half way down the back. Seeds numerous, minute.—Suffruticose, all over softly pubescent except the scabrous upper side of the leaves. Stipules truncated, short, ciliated with several long rigid bristles (as in *Spermacoce*). Flowers shortly pedicelled, in small compact capituliform peduncled terminal (or from their upper axils) corymbs.—*H. macrostemum*, Hook. and Arn. in Bot. Beech. Voy. p. 192.

2. *Dimetia*. Calyx-limb 4-toothed; teeth carinate, rigid, erect, in fruit distant with a rounded sinus. Corolla widely infundibuliform, papery, much bearded in the throat and along the segments: tube very short: segments linear, longer than the tube. Filaments long, filiform: anthers linear-oblong. Ovary pubescent on the apex, somewhat turbinate and 4-angled. Style bearded between the stigma (*H. scandens*, &c.), or glabrous (*H. capitellata*, &c.), shorter than the stamens. Capsule dry, coriaceous, with the apex compressed and protruded beyond the tube of the calyx, splitting at the apex (and there only) transversely to the dissepiment. Seeds numerous.—Twining suffruticose plants, usually glabrous, sometimes softly pubescent. Stipules connected into a loose truncated cup, with a single longish cuspidate point from the middle on each side. Flowers shortly pedicelled and corymbose (*H. scandens*, Roxb., Wall.! L. n. 839; *H. volubilis*, Br. in Wall.! L. n. 840; and *H. polycarpa*, Br. in Wall.! L. n. 836), or sessile and capituliform (*H. capitellata*, Br. in Wall.! L. n. 837; and *H. mollis*, Wall.! L. n. 859), arranged in terminal or subterminal corymbs or panicles.

Digitized by Google

§ 1. *Calyx-limb cup-shaped, with 4 short triangular erect teeth : disk on the apex of the ovary glabrous : epicarp rather succulent : cocci bony, opening on their inner face. Inflorescence a kind of paniole.*

1247. (1) H. (D.) *Lawsoniæ* (W. & A.:) shrubby, glabrous: branches 4-angled: leaves oblong-lanceolate, acuminated at both ends, petioled; nerves few and distant, curved: stipules deciduous, triangular-ovate, acuminated, the point thickened and glandular-lobed; the margin entire: panicle spreading: calyx-limb cup-shaped, 4-toothed: corolla externally glabrous, villous on the mouth and on the segments: filaments slightly protruded: style considerably protruded: capsule obovate, dicoccous.—Wendelandia Lawsoniæ, *DC. prod.* 4. *p.* 413.—Lawsonia purpurea, *Lam. enc. meth.* 3. *p.* 107.—*Rheed. Mal.* 4. *t.* 57.——Cochin in Malabar; *Rheede.*

Our specimens, from Ceylon, agree so exactly in almost every particular with Rheede's figure and description, that we have no doubt of their identity as species.

1248. (2) H. (D.) *stylosa* (Brown:) shrubby, glabrous: branches somewhat terete or obtusely 4-angled: leaves from oval to oblong-lanceolate, acuminated at both ends, petioled; the nerves on the under side strong, armed, slightly branched: stipules somewhat permanent, triangular-ovate; their margin pectinately pinnatifid, the segments long, filiform, hirsute: panicle spreading: calyx-limb cup-shaped, 4-toothed: corolla externally glabrous, villous in the mouth on the segments: filaments considerably protruded: style much protruded: capsule ovoid, dicoccous.—*Brown in Wall.! L. n.* 853; *Wight! cat. n.* 1290.—H. Leschenaultii, *a*, *DC.? prod.* 4. *p.* 422.—— Neelgherries.

The filaments vary considerably on the same specimen, but are in general considerably elongated. There is, however, a remarkable structure which we have observed in *H. macrostemon*, Hook. and Arn., *H. umbellata*, *H. Leschenaultii*, and some others, that, in the flowers where the filaments are elongated, the style is short, and in those with a long style the filaments are short: but whether this be constantly the case, or what may be the cause of it, will yet require careful examination on living plants: in *D. stylosa*, however short the filaments be, the style seems to be protruded. Our principal doubts about De Candolle's synonym arises from his description of the stipules, and from bringing under it, as a variety, the very distinct *H. scandens*, Wall. (*H. volubilis*, Br., but not, as far as we can see, really distinct from Roxburgh's plant); but, on the other hand, we have not seen any species from the Neelgherries that approaches so closely to De Candolle's description as the present one. It is possible, however, that Leschenault (from whom De Candolle obtained it) may have obtained the specimens from the Calcutta Botanic Garden, that the station given is incorrect, and that his plant is either *H. scandens* or *H. volubilis*.

1249. (3) H. (D.) *articularis* (Brown:) shrubby, glabrous: branches terete or obscurely 4-angled: leaves approximated sessile, narrow, oblong-lanceolate with the margins recurved, coriaceous, minutely papillose; nerves on the under side striæform, close, simple: stipules ovate-lanceolate, the opposite ones connate at the base; the margins divided into several filiform rigid segments: panicle coarctate: calyx-limb cup-shaped, 4-toothed: corolla externally puberulous, villous in the mouth and on the segments: filaments protruded; anthers oblong-linear: style scarcely longer than the tube of the corolla: capsule oblong-obovate, dicoccous.—*Brown in Wall.! L. n.* 854; *Wight! cat. n.* 1291.——Neelgherries.

The leaves appear minutely papillose, and as if scabrous under the microscope, but are not at all scabrous to the touch.

Digitized by Google

§ 2. *Calyx-limb deeply 4-cleft; segments lanceolate with their apices recurved when in fruit: disk of the ovary pubescent or hairy: epicarp rather dry: cocci between bony and crustaceous, opening on their inner face. Flowers corymbose.*

1250. (4) H. (D.) *fruticosa* (Linn.:) somewhat shrubby, glabrous: leaves petioled, oblong-lanceolate, attenuated at the apex, acuminated at the base, with numerous line-like simple nearly straight nerves: stipules triangular-ovate, cuspidate, with small gland-like teeth along the margin: flowers corymbose; corymb about 5-rayed, with two small leaves at its base: calyx-limb deeply 4-cleft; segments linear-lanceolate, in fruit erect with the points bent outwards: corolla externally glabrous, bearded in the mouth: filaments at length exserted: capsule oblong, dicoccous.—*Lam. ill. t.* 62. *f.* 1?—H. capitellata, *Wall. L. n.* 837. *b*, *c* (*p.* 213).—*Burm. Zeyl. t.* 107.—α; calyx, fruit, and rays of the corymb glabrous.—*Wight! cat. n.* 1292.—β; calyx, fruit, and rays of the corymb hispid with short spreading hairs.—*Wight! cat. n.* 1292. *b*.

The specimens distributed by Dr Wallich, as n. 837, *b*, do not correspond to that letter at p. 213, but to "2, Penang," at p. 24 of his List: both *b* and *c* at p. 213 were named by the missionaries *H. fruticosa*, and our specimens are from the same source. In our specimen of α, the filaments are very conspicuous; in that of β they are very short, but we are inclined to refer that difference to the different state of the blossoms we have examined.

1251. (5) H. (D.) *pruinosa* (W. & A.:) somewhat shrubby: stems terete and branches angled, glabrous: leaves petioled, oblong-lanceolate, acuminated at both ends, glabrous, with several (not numerous) line-like slightly curved nerves: stipules pinnatifid, the segments filiform: flowers in much branched terminal panicled trichotomous corymbs; their branches, with the calyx and corolla minutely pubescent: calyx-limb 4-partite; segments oblong-lanceolate, in fruit recurved: corolla hairy in the mouth: filaments short?: capsule densely covered with short pruinose somewhat mealy pubescence, dicoccous.—α; stipules short (roundish-ovate); capsules shortly turbinate.—*Wight! cat. n.* 1293.—H. corymbosa, *herb. Madr.!* (not *Sm.*, nor Old. corymbosa, *Linn.*); *Wall.! L. n.* 6202, *a*.—β; stipules elongated (oblong-lanceolate); capsule nearly globose.—*Wight! cat. n.* 1293, *b*.—H. corymbosa, *Wall.! L. n.* 6202, *b*.

In the very few corollas we have found on our specimens, the filaments were short and inconspicuous; but in others they may be perhaps elongated.

§ 3. *Calyx-limb 4-partite; segments lanceolate or long-linear, spreading or recurved when in fruit: epicarp dry: cocci crustaceous or slightly bony, opening at length on their inner face. Flowers capitate, sessile, terminal or axillary.*

1252. (6) H. *macrophylla* (Wall.:) stems stout, acutely 4-angled, glabrous: leaves petioled, oval, slightly pointed at both ends; upper side scabrous, under slightly puberulous particularly on the nerves: flowers axillary, very crowded and forming dense globose sessile heads in the axils of the leaves and about half the length of the petioles: fruit obovoid, crowned with the spreading segments of the calyx, and with them hispidly pubescent, dicoccous.—*Wall.! L. n.* 841.—H. nodiflora, *Wall. L. n.* 855 (according to Wall. l. c. p. 213).

As we have not seen the specimen from the Madras herbarium united to this plant by Dr Wallich, we have taken our description from one in Dr Hooker's herbarium from Pulo-Penang: it is destitute of flowers, so that we are a little uncertain about its affinities; we have brought it here principally from the dehiscence of the capsule.—To this subsection belongs *H. uncinella*, Hook. and Arn.! in Bot. Beech. voy. p. 192, and *H. cephalophora*, Brown in Wall.! L. n. 842, if indeed this last, from Silhet, be really a distinct species from the former.

Digitized by Google

1253. (7) H. *verticillaris* (Wall.?:) glabrous: leaves (upper ones) linear-lanceolate, opposite or with a few of the uppermost ones verticillate: stipules (to the opposite leaves) lanceolate, with a few bristle-shaped teeth along the margin, especially near the point: flowers sessile, capitate and terminal, or verticillate in the axils of the verticillated leaves; heads, when in the axils of the opposite leaves, peduncled: calyx-segments long, linear-lanceolate, longer than the tube of the corolla: corolla widely infundibuliform, hairy in the throat and along the base of the lobes: stamens much exserted: style short; stigma of two thickish segments.—*Wall.*? *L. n.* 6188; *Wight! cat. n.* 1367.

Dr Wallich mentions that his *H. verticillaris* was sent him by Dr Wight as a species of *Coccocypselum:* the specimen now before us, (a solitary and very imperfect one, and which we have faithfully described above), bears however no such corresponding name, and hence have arisen our doubts about the synonym: similar specimens, however, to ours were sent to Dr Wallich, and we do not see any other name in his List under which they can have been introduced.

SECT. 2. Calyx-limb 4-partite or 4-toothed: segments or teeth when in fruit erect or recurved, distant and with the sinus wide. Corolla narrow-infundibuliform or short-tubular, glabrous or slightly hairy on the inside: segments ovate, shorter than the tube. Filaments exserted or very short: anthers oblong-linear, exserted. Ovary pubescent or glabrous on the apex. Style glabrous. Capsule dry, crustaceous or somewhat coriaceous, more or less compressed, with the apex protruded beyond the calyx, more or less emarginate, splitting transversely to the dissepiment. Seeds few (1–8) in each cell, black, thin, scrobiculate (dotted as on a thimble).—Ascending or diffuse herbaceous or suffrutescent plants, generally turning blackish by drying, usually more or less hairy; all or some of the hairs often thick, soft, flat, and as if jointed. Stipules usually divided into several bristle-like but not rigid segments. Inflorescence usually lax, 1–3 or many-flowered, exterminal or axillary.—*Anotis*, DC.

This group is principally distinguished by its few-seeded capsules. We are uncertain if all of De Candolle's genus *Anotis* belong to it or not, but some of his species certainly do. To our first subsection we are disposed to refer *Anotis rotundifolia* of De Candolle, although with solitary axillary flowers; and also *H. calycina*, Wall.! L. n. 878, from its resemblance to *H. Rheedei:* to the second appear to belong *H. ingrata*, Wall. L. n. 863, *H. stipulata*, Br. in Wall.! L. n. 6195, and another Nepal species in Dr Hooker's herbarium (*H. Lindleyana*, Hook.) with the flowers almost sessile, and forming small peduncled or sessile terminal or axillary capituli. Perhaps also, although differing from the others by its almost coriaceous leaves, and being nearly glabrous, *H. urophylla*, Wall.! L. n. 6197, ought to be referred here. But the specimens of all of these, which we have seen, are much too imperfect to permit of us ascertaining their affinities with any degree of precision.

§ 1. *Capsule semicircular, emarginate, loculicidal, splitting to the base.*

1254. (8) H. (A.) *Rheedei* (W. & A.:) herbaceous, ascending, glabrous: leaves oval, obtuse or acute, acuminated at the base into a very short petiole: peduncles dichotomous, with a solitary shortly pedicellate flower in the forks: calyx 4-toothed; teeth short, triangular: corolla shortly hypocrateriform, glabrous on the inside: anthers oblong-linear: ovary with 2 ovules in each cell: capsule didymous, compressed, encircled by the calycine teeth about the middle, free from the calyx in its upper half, splitting to the base, 4-seeded; the valves divaricating: seeds cup-shaped.—*Wight! cat. n.* 1294.—*Rheed. Mal.* 10. *t.* 25 (pretty good).

Digitized by Google

The ovary coheres with the whole tube of the calyx, projecting slightly above it and then free, slightly 2-lobed, 2-celled, with 4 ovules: the ovules are apparently attached by their base to near the bottom of the cell. Style filiform; stigma bifid; segments short-linear, recurved. Seeds thin, cup-shaped, attached by their base, two in each cell, with the concave sides next each other, and so approximated as at first to resemble one globose seed. Albumen horny. Embryo linear in the middle of the axis. We have only been able to examine one flower on the unique specimen in Dr Wight's herbarium, and that in the state of bud and exceedingly minute: the filaments were very short, but perhaps become longer during flowering. Dr Wight's specimen is about 8 inches high, that figured by Rheede about 4 inches.

§ 2. *Capsule somewhat orbicular, much compressed, marked with a deep furrow on each side, dehiscing at the apex within the calyx-limb, and then at maturity only: seeds 2, thin-lenticular, attached to the stalked small placenta from the middle of the dissepiments; the one erect, the other pendulous; one of them occasionally abortive.*

1255. (9) H. (A.) *Wightiana* (Wall.:) herbaceous, diffuse, hairy; hairs short, flattish, jointed: stems rooting near the base, 4-angled: leaves ovate or oval, usually slightly acute, short-petioled: stipules entire, with a longish linear point: flowers small, somewhat capitate, heads terminal or axillary, sessile: capsule compressed, crowned with the erect teeth of the calyx, 4-seeded.—α; small, stems about 3 or 4 inches long, leaves 4–5 lines long.—*Wight! cat. n.* 1299.—Hedyotis Wightiana, *Wall.! L. n.* 6194.—β; larger, stems about a foot long, leaves from 8 lines to an inch long.—Spermacoce compressa, *Wall.! L. n.* 6187.——α; Neelgherries.

The stems of our var. β (from Silhet) appear compressed only by the process of drying; the four angles may be observed their whole length.

§ 3. *Capsule coriaceous, slightly compressed, splitting only at the apex, and there as if 2-lipped: seeds convex on the outside, concave on the other, and there marked with a linear ridge.*

1256. (10) H. (A.) *monosperma* (W. & A.:) herbaceous, procumbent, rooting: stems and branches slender, glabrous below, hairy towards the extremities: leaves petioled with the petioles more than one-half the length of the limb, deltoid-ovate, acute; upper side thickly under thinly sprinkled with flat jointed hairs: stipules with 2–4 hairy bristles on each side: corymbs somewhat terminal, simple, small, few-flowered: corolla shortly infundibuliform, the tube about twice the length of the calyx-segments: capsule compressed-globose, crowned with the distant spreading calyx-teeth; seeds solitary! in each cell.—*Wight! cat. n.* 1295.——Neelgherries, growing among moss.

The albumen is fleshy: embryo terete. Seed always solitary, very convex on the back, slightly concave in front.

1257. (11) H. (A.) *deltoidea* (W. & A.:) herbaceous, procumbent: stems flexuose: petioles and inflorescence glabrous: leaves deltoid-ovate, acute, tapering a little at the base into a petiole about a third of the length of the limb: upper sides sprinkled with short flat jointed hairs, under pale, very sparingly sprinkled with hairs particularly on the nerves: bristles of the stipules about 2 on each side, much shorter than the petioles: corymbs terminal, peduncled, trichotomous: calyx-segments oblong, enlarged after flowering: corolla infundibuliform; tube slender, 4–5 times longer than the calyx-limb: filaments considerably exserted.—*Wight! cat. n.* 1296.——Dindygul mountains.

We have not seen the fruit. The stems appear almost suffrutescent at the

Digitized by Google

base. From its great affinity with the two next, we are not disposed to place much dependence on the elongation of the filaments.

1258. (12) H. (A.) *affinis* (W. & A.:) herbaceous, procumbent, rooting: stems flexuose, branched, or villous particularly near the extremities: hairs on the branches and leaves flat and jointed: leaves deltoid-ovate, acute, tapering slightly at the base into a petiole about one-third of the length of the limb, sprinkled with hairs on both sides, paler on the under: bristles of the stipules 2–4 on each side, much shorter than the petioles: corymbs shortly hirsute, terminal, peduncled, trichotomous: calyx-segments cuneate-lanceolate, becoming larger and somewhat foliaceous immediately after flowering: corolla infundibuliform; tube slender, 4–5 times longer than the calyx-segments: filaments exserted and the style short, or filaments short and the style elongated: capsule with 6–8 seeds in each cell.—*Wight! cat. n.* 1297. ——Dindygul mountains.

1259. (13) H. (A.) *Leschenaultiana* (W. & A.:) herbaceous, rooting at the base: stems long, little branched, straggling, villous or hairy particularly towards the extremities: hairs on the branches and leaves flat and jointed: leaves broadly ovate, acuminated, acute, obtuse or somewhat cordate at the base, shortly petioled or sessile; upper side sprinkled with hairs, under villous or hairy: bristles of the stipules 2–6 on each side, longer than the sheathing portion and than the petioles: corymbs hirsute, terminal, peduncled, trichotomous: calyx-segments oblong, becoming larger cuneate-lanceolate and somewhat foliaceous after flowering: corolla infundibuliform, often hairy; tube slender, 4–5 times longer than the calyx-limb: filaments exserted or short: style short or exserted: capsule with 6–8 seeds in each cell.—*Wight! cat. n.* 1296.—Putoria Indica, *DC.? prod.* 4. *p.* 577.——Dindygul mountains. Neelgherries.

A much larger and stouter species than any of the former; it varies so very much in hairiness that we had almost combined it with the two preceding into one species, and perhaps we had acted more correctly if we had done so. Whether as varieties or species, they may be distinguished from each other by the following short characters:—*H. deltoidea;* stems and corymbs glabrous:—*H. affinis;* stems and corymbs hairy, leaves small, acute at the base, stipularly bristles small:—*H. Leschenaultiana;* stems and corymbs hairy, leaves usually pretty large, obtuse or retuse at the base, stipularly bristles elongated. We possess numerous specimens of the last, and but few of the two former, which makes us speak cautiously of their merits as species. The two last exhibit the remarkable variation of length in both the filaments and style noticed under *H. stylosa.*

SECT. 3. Calyx-limb 4-partite; segments in fruit spreading, with the sinus scarcely acute. Corolla short, tubular; tube scarcely ever exceeding and often shorter than the calyx-segments. Fruit globose, very small, hard and nut-like; the apex within the calyx circular, very shortly pointed with the permanent base of the style, scarcely dehiscing, and only in maturity. Seeds several, often few, in each cell.—Suffrutescent plants with decumbent spreading branches. Leaves marked beneath with simple line-like nerves. Stipules with one or several bristles. Inflorescence small, axillary, corymbose or capitate, peduncled or sessile. —*Euhedyotis.*

H. auricularia, Linn., the acknowledged type of the genus, belongs to this section. The dehiscence of the capsule takes place at so mature a stage, that we have not observed it in any one specimen in our herbarium: is the capsule really indehiscent? or is the dehiscence, as we suspect, septicidal? The inflorescence, although considerably variable, scarcely presents sufficient characters for a subdivision. To the more lax kind, so far as we can judge from the imperfect materials we have seen,

Digitized by Google

belong *H. ulmifolia*, Wall.! L. n. 862, *H. subcarnosa*, Wall.! L. n. 860 (perhaps identical with the preceding), *H. glabra*, Br. in Wall.! L. n. 848 (*Knoxia glabra*, DC., or *Spermacoce glabra*, Roxb. in E. I. C. mus. tab. 1116), and *H. vestita*, Br. in Wall.! L. n. 847: to the more compact, *H. costata*, Br. in Wall.! L. n. 849, and *H. nervosa*, Lam?, Wall.! L. n. 857. We have not seen the flowers of *H. congesta*, Br. in Wall. L. n. 844; the inflorescence is compact, axillary and sessile, and in that respect, as well as in the indurated base of the style, agrees with the present section; but the fruit is obovoid, slightly fleshy, and splits into two hard bony nuts, in which we have not observed any trace of a loculicidal opening at the apex; the stipules are as in our first section.

1260. (14) H. *auricularia* (Linn.:) stems or branches simple, 4-angled, hirsute towards the extremities and under the joints, otherwise usually glabrous: leaves nearly sessile, ovate-lanceolate, acute, glabrous; under side strongly marked with the prominent more or less pubescent nerves: stipules with several bristles: flowers axillary, nearly sessile, crowded and somewhat verticillate, scarcely exceeding the stipules: capsule sphærical, glabrous, crowned with the spreading lanceolate calyx-segments.—*DC. prod.* 4. *p.* 420; *Spr. syst.* 1. *p.* 412; *Wight! cat. n.* 1300.—H. hirsuta, *Lam. enc. meth.* 3. *p.* 79.—H. lineata, *Wall! L. n.* 6198 (not *Roxb.*).—*Rheed. Mal.* 10. *t.* 32 (good); *Burm. Zeyl. t.* 108. *f.* 1 (bad).——Travancore. Malabar.

H. auricularia of Roxburgh appears by his description and Dr Wallich's observations to be the same as *H. hispida*, Roxb. (Wall. L. n. 845), and probably also of Retz.

SECT. 4. Calyx 4-partite; segments in fruit erect, converging, rigid, with the sinus very acute. Corolla short-tubular, scarcely longer than the calyx-segments. Capsule ovate, dry, dehiscing at the apex within the calyx transversely to the dissepiment. Seeds several, sometimes few.—Herbaceous or suffrutescent plants with the habit of *Spermacoce*. Stipules with several rather rigid bristles. Leaves usually scabrous particularly near the margins. Flowers nearly sessile, usually in the axils of the leaves, rarely in dichotomous leafy corymbs.—*Sclerometrion*.

This section alone corresponds with the character of *Hedyotis* as proposed by Chamisso and Schlechtendal, and adopted by De Candolle. The original Linnæan species, however, does not belong to it. To it may be referred *H. hispida*, Wall.! L. n. 845, *H. angustifolia*, Cham. and Schlect. (from which *H. pinifolia*, Wall.! L. n. 850. does not appear to differ), *H. fimbriata*, Wall.! L. n. 851, *H. approximata*, Br. in Wall.! L. n. 852, and some others.

1261. (15) H. (S.) *nitida* (W. &. A.:) diffuse: branches somewhat simple, elongated, 4-angled, glabrous, slightly scabrous on the angles: leaves oblong-lanceolate, acuminated at both ends, nearly sessile; upper side shining, scabrous: stipules with numerous longish rigid bristles: flowers sessile, usually solitary in the axils, scarcely so long as the stipular bristles: capsule glabrous, crowned with the rigid converging shortly and stiffly ciliated segments of the calyx.—*Wight! cat. n.* 1301.

H. approximata, Brown, principally differs by the much narrower leaves, and more numerous flowers in their axils.

1262. (16) H. (S.) *cærulea* (W. & A.:) annual, branched from the root, diffuse: leaves setaceous, bristle-pointed: stipules with several bristles: flowers nearly sessile, arranged in axillary or terminal peduncled sparingly dichotomous leafy corymbs; lower ones solitary in the forkings of the corymbs, upper ones approximated and somewhat capitate: capsule glabrous, nearly globose, crowned with the lanceolate rigid erect calyx-segments.—*Wight! cat. n.* 1302.——Munargoody, (a village in Tanjore, between 30 and 40 miles from Negapatam), in the moist soil of the edge of a tank among grass.

A very remarkable species, with somewhat the habit of *H. umbellata*;

Digitized by Google

it is not, that we know of, noticed in Dr Wallich's List; the flowers are blue. It bears the native name of Vashap-pilloo or Poison-grass.

SECT. 5. Calyx 4-partite or 4-toothed, segments in fruit erect, usually distant with the sinus obtuse, sometimes forming a slightly acute angle with each other but not converging. Corolla short-tubular, infundibuliform, or somewhat rotate. Capsule roundish-ovate, turbinate, or oval, usually dry and crustaceous, sometimes coriaceous, compressed at the apex, and there dehiscing readily transversely to the dissepiment. Seeds numerous, minute.—Usually herbaceous, very rarely suffruticose plants.—*Oldenlandia*, Linn.

§ 1. *Corolla rotate: anthers linear-oblong: stigma thick, deeply 2-cleft, the lobes recurved: capsule globose, crustaceous, not angled. Suffruticose: leaves linear, somewhat verticillate: flowers white, in a peduncled short-roundish slightly compound raceme.*

1263. (17) H. (O) *umbellata* (Lam.:) suffruticose, erect or diffuse, slightly scabrous: leaves opposite or verticillate, linear, paler on the under side, margin recurved: stipules ciliated with bristles: peduncles alternate, axillary, bearing a short raceme; partial peduncles 1–3-flowered: capsule globose with a wide dehiscence.—*Lam. ill. n.* 1429; *Spr. syst.* 1. *p.* 413; *Wall.! L. n.* 871; *Wight! cat. n.* 1303.—H. hispida, *Roth, nov. sp. p.* 95.—H. Indica, *Roem. and Sch. syst.* 3. *p.* 195.—Oldenlandia umbellata, *Linn.; DC. prod.* 4. *p.* 426; *Roxb. Cor.* 1. *t.* 3; *fl. Ind.* 1. *p.* 421; (*ed Wall.*) 1. *p.* 442.—*Pluk. t.* 119. *f.* 4.

The stamens and style vary much in length and inversely to each other.

§ 2. *Corolla rotate; tube short and gibbous, the mouth closed with hair: stamens inserted on and inclosed within the tube, anthers globose: style stout, somewhat spindle-shaped: stigma no thicker than the style: ovary acutely 4-angled: capsule shortly turbinate, with two acute angles or wings: seeds globose, numerous, scrobiculate. Diffuse or erect, annual or biennial branched herbaceous glabrous plants: branches 4-angled: leaves broad, somewhat fleshy: flowers white.*

1264. (18) H. (O.) *alata* (Koen.:) annual, glabrous: leaves narrow-oblong, slightly acute, tapering at the base: flowers short-pedicelled, 1–3 in the alternate axils, and upon a terminal naked common peduncle: limb of the calyx in fruit widely cup-shaped, 4-lobed; lobes roundish-ovate, acute, in fruit with the sinus rather acute-angled: capsule shortly turbinate, with two broadish membranous wings, and two narrower ones, decurrent from the points of the calyx-lobes to the middle of the pedicel.—*Koen. in Wall.! L. n.* 6196 (not *Roxb.*); *Wight! cat. n.* 1304.—Gonotheca Blumei, *DC.? prod.* 4. *p.* 429.——Circars.

1265. (19) H. (O.) *biflora* (Br.:) annual or biennial, glabrous: leaves elliptic-oblong, attenuated at the base: flowers pedicelled, 2–3 together on longish alternate axillary or terminal peduncles: limb of the calyx deeply 4-cleft; segments triangular-acuminated, in fruit with the sinus rounded: capsule shortly turbinate, with two prominent sharp keels and two less prominent from the apex of the teeth to its base.—*Brown in Wall.! L. n.* 879; *Wight! cat. n.* 1305.—Oldenlandia biflora, *Linn.* (according to *Brown.*)

This is exactly intermediate between *H. alata* and the following: from the former it differs by the want of the membranous wings on the capsule, and by the limb of the calyx more deeply divided: from the latter, by the larger size of the capsule and much less branched inflorescence. We have some doubts to which *Old. paniculata*, Roxb. fl. Ind. (*O. radicans*, Roxb. in E. I. C.

Digitized by Google

mus. tab. 1343) may belong: the inflorescence is more that of *O. biflora*, while in the size of the fruit it resembles *O. racemosa*: we are most inclined to refer it to the latter.

1266. (20) H. (O.) *racemosa* (Lam.:) annual or biennial, diffuse, glabrous: leaves elliptic oblong, or lanceolate, obtuse or acute, attenuated at the base: flowers pedicelled, disposed in long-peduncled naked alternate-axillary and terminal racemes; the partial peduncles 1–3 flowered: limb of the calyx 4-partite; segments triangular-ovate, acute, in fruit distant with the sinus wide: capsule shortly turbinate, slightly marked with 4 acute decurrent angles.—*Lam. enc. meth.* 3. *p.* 76. *ill. t. f.* 2; *Spr. syst.* 1. *p.* 413; *Wall.! L. n.* 875; *Wight! cat. n.* 1306.—Oldenlandia alata, *Roxb. fl. Ind.* 1. *p.* 421; (*ed Wall.*) 1. *p.* 442; *in E. I. C. mus. tab.* 547; *DC.? prod.* 4. *p.* 427. —O. paniculata, *Linn.?*; *DC.? l. c.*——Circars. Tanjore, frequent in moist rich soil.

This varies greatly in size and general appearance: it is, as far as our observations go, always diffuse and procumbent, but when supported by bushes, &c. it grows to a great length, sometimes 3–4 feet. *Gerontegea racemosa*, Cham.! in Linnæa, 4. p. 154, as to the specimens from Radack, is quite distinct from our plant; it seems more allied to Roxburgh's *Old. ramosa* (in E. I. C. mus. tab. 1946). We have not seen the Linnæan specimen of *Old. paniculata*, and therefore retain the name given by Lamarck, the more as we feel certain that Mr Brown would have restored the Linnæan one in Wallich's List had it really belonged to this species. *Old. paniculata*, Burm. Ind. t. 15. f. 1. is perhaps different from either, but the figure is very bad.

§ 3. *Corolla tubular or rotate, scarcely longer than the calyx-segments: stamens inserted on the mouth of the tube: anthers oval: style slender: stigma bifid, with the segments recurved: capsule crustaceous, usually globose, rarely turbinate-oblong. Annual herbaceous plants, with usually narrow or rarely broad leaves.*

1267. (21) H. (O.) *trinervia* (Roem. & Sch.:) herbaceous, branched, procumbent, rooting near the base: stems slender, from glabrous to slightly hairy: leaves petioled, roundish ovate or oval, glabrous, sprinkled with a few hairs on the margin, somewhat 3-nerved: stipules slightly hairy, bipartite, segments acuminated: flowers shortly pedicelled, usually in pairs (1–4) in the axils of the leaves: corolla rotate, 4-partite, glabrous within; tube scarcely any: capsule hirsutely villous, crowned with the remote calycine teeth.—*Roem. and Schult.* 3. *p.* 197; *Spr. syst.* 1. *p.* 413; *Wight! cat. n.* 1307.—H. rotundifolia, *Spr. pug.* 2. *p.* 33; *DC. prod.* 4. *p.* 420.—H. serpyllifolia, *Poir. enc. meth. suppl.* 3. *p.* 14; *DC. l. c. p.* 421.—H. orbiculata. *Wall.! L. n.* 6191. Oldenlandia trinervia, *Retz, obs.* 4. *p.* 23.—O. repens, *Burm. Ind. p.* 38. *t.* 15. *f.* 2 (bad).——Damp soil under the shade of hedges, &c.

We have compared this with specimens from the Mauritius, and do not perceive any difference. Perhaps *Old. depressa*, Willd., belongs to this species, but the description of the leaves does not correspond so well as to those of *Peplidium cochlearifolium*, Sm. (*Old. maritima*, Linn.): Willdenow never saw the flower, and the figure in Rheede to which he refers is *Portulaca quadrifida*.

1268. (22) H. (O.) *pumila* (Linn.:) annual, diffuse, glabrous or slightly scabrous: leaves from elliptic-oblong to oblong-lanceolate, attenuated at the base into a short petiole: peduncles solitary, axillary, alternate, either about the length of the leaves and 1-flowered, or about half the length of the leaves and with two pedicellate flowers, the peduncles and pedicels together somewhat longer than the leaves: corolla shortly tubular, hairy in the mouth: calyx-segments triangular-acuminated, in fruit slightly spreading and separated by a rather acute angle: capsule turbinate-oblong, compressed.—*Linn. suppl. p.* 119; *Spr. syst.* 1. *p.* 412; *Wall.! L. n.* 6200: *Wight! cat. n.* 1308.—Ol-

Digitized by Google

denlandia pumila, *DC. prod.* 4. *p.* 425.—O. crystallina, *Roxb. fl. Ind. p.* 422; (*ed Wall.*) 1. *p.* 443; *in E. I. C. mus. tab.* 1117; *DC. l. c. p.* 426.——Chingleput, near Madras. Guzzlehette Pass. Trevalore, near Negapatam.

We have the same species from Java, so that it is probably widely distributed throughout India.

1269. (23) H. (O.) *intermedia* (W. & A.:) annual or biennial, diffuse, glabrous or slightly scabrous: leaves linear-lanceolate, tapering at both ends: peduncles solitary, axillary, alternate, 1–2-flowered, with the pedicels shorter than the leaves: corolla shortly tubular: calyx-segments in fruit somewhat subulate, distant with the sinus wide: capsule glabrous, shortly turbinate-oblong, or roundish-turbinate.—*Wight! cat. n.* 1309.—H. Burmanniana, *Wall. L. n.* 868. *h.*

We have presumed to separate this species from the next, principally on account of its capsule not being gibbous at the base as in the following. In Dr Wight's specimens the capsule is almost hemispherical; but in others transmitted by the late Dr Shuter of Madras to Dr Hooker, and preserved in his herbarium, it is almost as long as in *H. pumila*. From *H. pumila* it is readily distinguished by its leaves as well as by remoteness of the calyx-segment; and from *H. Burmanniana* by the shorter branches, and the capsule widening upwards from the base to the crown: it is thus precisely intermediate. It appears also to be allied closely to *H. alsinæfolia*, Br., in Wall.! L. n. 873, but in that species the peduncles bear a short few-flowered raceme instead of merely two flowers.

1270. (24) H. (O.) *Burmanniana* (Br.:) annual, diffuse, glabrous or scabrous: branches elongated: leaves linear or linear-lanceolate, tapering at both ends: peduncles solitary, axillary, alternate, shorter than the leaves, 1–3-flowered: corolla shortly tubular: calyx-segments in fruit somewhat subulate, distant with the sinus wide: capsule glabrous, roundish-ovate (gibbous at the base, and narrower towards the crown).—*Br. in Wall.! L. n.* 868; *Wight! cat. n.* 1310.—H. biflora, *Lam. ill. n.* 1427; *Roth, nov. sp. p.* 92.—H. diffusa, *Willd. sp.* 1. *p.* 566 (according to *Cham.*).—Oldenlandia biflora, *Lam. enc. meth.* 4. *p.* 533 (not *Linn.*); *DC. prod.* 4. *p.* 426; *Roxb. fl. Ind.* 1. *p.* 422; (*ed Wall.*) 1. *p.* 445; *in E. I. C. mus. tab.* 1342.—Gerontegea biflora, *Cham. and Schl. in Linnæa,* 4. *p.* 155.—*Burm. Zeyl.* 22. *t.* 11 (fig. and descr. of flower bad); *Rheed. Mal.* 10. *t.* 35.

The flowers in the same specimen are sometimes solitary, sometimes in pairs, and sometimes in threes on the peduncles. The length likewise of the peduncle is very variable; in some specimens it is scarcely longer than the petiole, in which case it is always, we believe, 1-flowered, as is the case with Wall. L. n. 868. *a*!, which we presume to have been examined and named by Brown; perhaps from this circumstance, as De Candolle has suggested, *Old. diffusa*, Roxb. (*O. pauciflora*, Roxb. in E. I. C. mus. tab. 1341), ought to be united with the present species; the flowers, however, are represented much larger than any we have seen. In Roxburgh's drawing of his *O. biflora*, the peduncles are all 2-flowered; so that there may have been some mistake in Dr Wallich's referring Roxburgh's herbarium specimen of that plant to *O. Heynei;* Brown refers it to *H. Burmanniana*. From the imperfect specimen we have seen (in Dr Hooker's herbarium) we can scarcely point out any character between *Old. tenuifolia*, Forst., and the state of our plant which has 1-flowered peduncles.

1271. (25) H. O. *brachiata* (Wight:) annual, more or less scabrous, branched at the base: branches erect or ascending, short, somewhat simple: leaves narrow linear or subulate, rigid, mucronate, the margins recurved: flowers longish pedicelled, arranged singly or in pairs in terminal (or from the upper axils) lax naked racemes: corolla tubular: capsule crowned with the distant teeth of the calyx, shortly hemispherical or somewhat didymous.—*Wight! in Wall.! L. n.* 6201 (partly); *cat. n.* 1311.—*Pluk. t.* 114. *f.* 2 ? (bad).

Digitized by Google

The placentæ are oval, and attached by stalks to near the bottom of the dissepiment.

1272. (26) H. (O.) *nudicaulis* (W. & A.:) annual with a filiform root: leaves 4–5, all radical, roundish ovate, slightly attenuated at the base, sessile, sprinkled with short hairs particularly on the margin and nerves underneath: scapes 2–3, slender, scabrous from close short fuscous hairs, bearing each about the middle a lax corymbose spreading 3–4-chotomous panicle; pedicels bristle-shaped, glabrous: corolla with a very short tube, bearded in the throat with white hairs: capsule somewhat globose.—Oldenlandia medicaulis, *Roth, nov. sp. p.* 96; *Spr. syst.* 1. *p.* 446.—H. scapigera, *Br.? in Wall.! L. n.* 881.

§ 4. *Corolla infundibuliform: tube slender, about twice the length of the calyx-segments or shorter, segments of the limb much shorter than the tube: anthers oval, in the throat of the tube, exserted or somewhat included: style slender: stigma bifid; segments recurved: capsule crustaceous, somewhat globose. Annual or biennial herbaceous plants with usually narrow leaves and slender pedicels.*

1273. (27) H. (O.) *Heynei* (Br.:) annual or biennial, erect or decumbent with erect branches, dichotomous, glabrous: stems sometimes terete at the base, above and the branches acutely 4-angled: leaves linear or linear-lanceolate: stipules with several short bristles, or often truncated and naked: pedicels 1-flowered, axillary, solitary or in pairs, in the opposite or alternate axils, shorter than the leaves, 4–8-times longer than the fruit, rigid: calyx-segments in fruit distant with the sinus wide, from triangular-acuminated and small to oblong-lanceolate and elongated: corolla infundibuliform: anthers somewhat included: capsule roundish-ovate, gibbous at the base, crustaceous, opening with a very elevated compressed widely dehiscent ridge across the apex, lips of the opening erect.—*Br. in Wall.! L. n.* 867; *Wight! cat. n.* 1312.—H. herbacea, *Willd. sp.* 1. *p.* 566 (not *Linn.* according to *Brown*); *Spr. syst.* 1. *p.* 412; *Roth, nov. sp. p.* 92.—Oldenlandia herbacea *Roxb. fl. Ind.* 1. *p.* 424; (*ed Wall.*) 1. *p.* 445; *DC. prod.* 4. *p.* 425.—O. dichotoma, *Roxb. in E. I. C. mus. tab.* 546.—O. asperulæa, *DC.? l. c.—Rheed. Mal.* 10. *t.* 23; *Pluk. t.* 130. *f.* 3?

Had Mr Brown not declared the Linnæan *H. herbacea* to be distinct, we would have followed other botanists in considering the present to be that plant: in those specimens which have the calycine teeth enlarged, the leaves also are broader and with the margin slightly undulated. Plunkenet's t. 125. f. 5, may perhaps represent a narrow-leaved specimen of this species taken from the summit of a branch, where often the leaves become small and almost abortive.

1274. (28) H. (O.) *dichotoma* (Koen.:) annual, erect or decumbent with erect branches; branches slightly 4-angled, scabrous on the angles: leaves linear, attenuated at both ends, flaccid: stipules usually with 2–3 bristles, sometimes truncated and without any: flowers on long and capillary pedicels, rarely axillary and solitary, sometimes 2–3 from the apex of a slender elongated peduncle, usually several arranged in very lax peduncled axillary or terminal naked racemes: corolla infundibuliform: calyx-segments in fruit remote with the sinus wide: capsule nearly globose or slightly globular-ovate, with the ridge on the apex not very prominent.—H. dichotoma, *Koen.* (not *Cav.*) *herb. Madr.!; Roth, nov. sp. p.* 93; *Wall.! L. n.* 6204; *Wight! cat. n.* 1313.—H. brachiata, *Wall.! L. n.* 6201 (as to H. graminifolia).—H. attenuata, *Willd. act. am. nat. cur. Berol.* 4. *p.* 216.—H. affinis, *Roem. and Schult. syst.* 3. *p.* 194.—H. linifolia, *Willd.; Roem. and Sch. l. c. p.* 526.—H. diffusa, *Spr. l. c.*—O. linearifolia, *herb. Madr.!*—O. linifolia, *DC. l. c.*—O. capillaris, *DC. l. c. p.* 426.—O. affinis, *DC. l. c. p.* 428.—O. pusilla, *Rottl.!; DC. l. c.*——Trichinopoly. Travancore.

Digitized by Google

Chamisso and Schlechtendal refer *Old. linearifolia* of Klein (or herb. Madr. as we have designated his specimens) to *Old. biflora*, and state that it represents in Willdenow's herbarium his *H. diffusa*; on which account it is probable that *H. diffusa*, Willd., ought to be adduced here, and not under *H. Burmanniana*. *Old. capillaris*, DC., was described from specimens transmitted him by Dr Hooker; and as these were sent to Dr H. by Dr Wight, through Dr Shuter of Madras, we feel no uncertainty about that synonym. The number of flowers on each peduncle varies considerably in the same specimen, and occasionally the pedicel is axillary and solitary without the intervention of a peduncle: on which account we would be almost disposed to refer here *Old. tenuifolia*, Burm. Ind. t. 14. f. 1, but as that is from Java it may probably be very distinct.

§ 5. *Corolla infundibuliform, internally glabrous, 2–3 times longer than the calyx-segments; segments of the limb about as long as the tube, oblong-linear: filaments exserted; anthers oblong-linear: style as long as the corolla; stigma bipartite, the segments long-linear: capsule coriaceous, ova', loculicidal, crowned with the distant teeth of the calyx.*

1275. (29) H. (O.) *maritima* (Wall.:) perennial, diffuse, procumbent, glabrous and somewhat glaucous: stems and branches twiggy: leaves linear-lanceolate, attenuated at both ends: stipules united with the short petioles into a membranous truncated sheath: flowers pedicillate, alternate on the branches of longish terminal or subterminal simple or dichotomously branched racemes: calyx-limb 4-partite; segments distant with the sinus rounded: corolla infundibuliform: stamens exserted: capsule coriaceous oval.—*Wall.! L. n.* 6192; *Wight! cat. n.* 1314.—H. graminifolia, *Linn.? suppl.* 1. *p.* 119; *Spr.? syst.* 1. *p.* 413; *herb. Madr.!*—Oldenlandia stricta, *Linn. mant. p.* 200. O. graminifolia, *DC.? prod.* 4. *p.* 425.——Sea coast, in loose sandy soil, in the southern districts.

If Klein and Rottler be correct, this is *H. graminifolia* of Linnæus, but neither the name nor description given in the Suppl. Plant. accords so well with the present species as with *H. dichotoma*. Until, then, we have an opportunity of consulting the original specimens, we prefer following Dr Wallich in adopting a more appropriate name, expressive of the situation in which only, we believe, it is to be found.

§ 6. *Corolla infundibuliform; tube slender, 5–6 times longer than the calyx-segments, inflated immediately below the limb; segments of the limb much shorter than the tube: anthers linear oblong, included within the swollen part of the tube: style slender: stigma bifid, segments spreading: capsule crustaceous, nearly globose, truncated, slightly compressed, crowned with the distant teeth of the calyx. Herbaceous erect twiggy branched plants with narrow leaves, and terminal corymbose or loosely spiked cymes*—Kohautia, *Cham. and Schl.*

1276. (30) H. (O.) *aspera* (Heyne:) annual, erect, simple, or with a few straight simple erect branches, all over rough with minute points: leaves linear-acuminated; stipules membranous, with 1–3 longish subulate points: cymes terminal, long-peduncled, usually of one short central branch and two longish lateral ones: flowers usually in pairs, shortly pedicelled, with or without a short partial peduncle, racemosely and rather distantly arranged along the branches of the cyme: calyx-teeth approximated during flowering, in fruit distant with the sinus wide: corolla long-infundibuliform: anthers included: capsule nearly globose, somewhat didymous, truncated.—*Heyne in Roth, nov. sp. p.* 94; *Spr. syst.* 1. *p.* 415; *Wight! cat. n.* 1315.—H. elongata, *Br. in Wall.! L. n.* 865.—H. paniculata, *herb. Rottl.!* (not *Lam.*)—Oldenlandia aspera, *DC. prod.* 4. *p.* 428.——Arcot. Dindygul hills.

Digitized by Google

Roth's description, taken from nearly unbranched specimens similar to what we also possess from Heyne's herbarium, is so very faithful, as to leave no doubt but Brown had overlooked it when he proposed a new name for this species. The root is nearly simple, descending, long, straight or slightly flexuose. We have before us a few specimens from Pathoocottah with the stem apparently decumbent, the branches unilateral and flexuose, and the flowers in a much branched dense panicle; but this is obviously the effect of accident.

Species known only by name.

†1277. (31) H. *linarifolia* (Brown.)—*Br. in Wall. L. n.* 870.—H. capitata, *herb. Heyne.*

†1278. (32) H. *tubularis* (Brown.)—*Br. in Wall. L. n.* 876.—H. capitata, *Wight.*—Gratiola aromatica, *herb Heyne.*

†1279. (33) H. *minima* (Heyne.)—*Heyne in Wall. L. n.* 877.

†1280. (34) H. *Mysorensis* (Heyne.)—*Heyne in Wall. L. n.* 882.

†1281. (35) H. ? *triflora* (Heyne.)—*Heyne in Wall. L. n.* 883.

†1282. (36) H. *puberula* (Brown.)—*Br. in Wall. L. n.* 884.

†1283. (37) H. *cymosa* (Brown.)—*Br. in Wall. L. n.* 885.

†1284. (38) H. *glabella* (Brown.)—*Br. in Wall. L. n.* 886.—H. hispida, *herb. Heyne.*

†1285. (39) H. *pygmæa* (Wall.)—*Wall. L. n.* 6199.—Oldenlandia scabra, *Wight; herb. Madr.*

TRIBE IV. GUETTARDACEÆ. *Kunth.*

Fruit drupaceous, containing 2–8 nuts, or 1 several-celled nut; nuts or cells 1-seeded, very rarely with 2 seeds, the one above the other. Seeds somewhat terete, elongated, usually erect. Albumen fleshy.—Shrubs or small trees. Leaves opposite or sometimes in threes, with interpetiolar stipules.

SUBTRIBE I. MORINDEÆ. *DC.*

Flowers and fruit densely aggregated, cohering, and forming a capitulus.

XIV. MORINDA. *Vaill.; Linn.; Lam. ill. t.* 153; *Gærtn. fr.* 1. *t.* 29.

Calyx-tube obovate, usually concrete with those of the nearest flowers; limb short, scarcely toothed. Corolla infundibuliform; tube somewhat terete; limb spreading, 5–4-lobed: æstivation valvular. Stamens 5–4: filaments usually very short and with the anthers (linear) included, rarely with the anthers protruded. Style filiform. Stigma bifid; segments filiform. Berries containing 2–4 nuts, usually concrete into one compound fruit, marked on the apex by the traces of the calyx: nuts 1-seeded. Embryo terete in a fleshy albumen.—Erect or climbing shrubs or trees. Leaves opposite, rarely 3–4 in a verticil. Stipules within the petioles, usually obtuse or membranaceous. Peduncles solitary or several together, axillary or leaf-opposed, or terminal, occasionally from luxuriance concrete at their base into one common peduncle. Flowers aggregated, sessile upon a globose receptacle: capituli dense, globose or ovate, changed in fruit to a spurious or compound berry. Bark of the root used for dyeing.

Digitized by Google

§ 1. *Corolla long, infundibuliform, 5-cleft, with a wide mouth: stamens 5. Peduncles either terminal and in pairs, or axillary, or leaf-opposed (from the abortion of a leaf).*—Roioc, *DC.*

1286. (1) M. *citrifolia* (Linn.:) somewhat arboreous, glabrous: branchlets 4-angled: leaves oval, attenuated at both ends, shining: stipules membranaceous, obtuse: capituli shortly peduncled, leaf-opposed, without bracteas: corolla long-infundibuliform; limb 5- (occasionally 4–7-) cleft: anthers half hid in the tube: style the length of the tube: berries concrete into an obtuse ovate shining fruit.—*DC. prod* 4. *p.* 446; *Spr. syst.* 1. *p.* 750; *Gærtn. fr.* 1. *t.* 29; *Roxb. fl. Ind.* 1. *p.* 541; (*ed. Wall.*) 2. *p.* 196; *Ham. in Linn. soc. trans.* 13. *p.* 533; *Wight! cat. n.* 1316.—*Rheed. Mal.* 1. *t.* 52; *Rumph. Amb.* 3. *t.* 99.

1287. (2) M. *tinctoria* (Roxb.:) somewhat arboreous, glabrous: leaves oblong or oblong-lanceolate, tapering at both ends, not shining: stipules short: capituli shortly peduncled, leaf-opposed or in the axil of a smaller leaf, without bracteas: corolla long-infundibuliform; limb 5-cleft: anthers included: style and stigmas exserted: berries concrete into an oval head.—*Roxb. fl. Ind.* 1. *p.* 543; (*ed. Wall.*) 2. *p.* 197; *DC. prod.* 4. *p.* 447; *Spr. syst. suppl. p.* 80; *Wight! cat. n.* 1317.—M. citrifolia, *Roxb. in E. I. C. mus. tab.* 918.

Although we retain this species, and have taken our character from Roxburgh, yet it appears to us to be the wild state, and *M. citrifolia* the more usually cultivated one of the same plant: the slight difference pointed out in the degree of protrusion of the anthers and style are not, we fear, either sufficiently well marked or constant. We have some doubts if Dr Wight's specimens be quite the same as Roxburgh's: if they be so, we may add to the above, that *M. citrifolia* has the leaves thin and flaccid, *M. tinctoria* firm and hard. The length of the petiole affords no character in any of the species of this genus.

*1288. (3) M. *bracteata* (Roxb.:) arborescent, glabrous, rigid: leaves oval-oblong, pointed at both ends, shining: stipules broader than long, rounded: capituli short-peduncled, leaf-opposed, solitary, bracteated: bracteas few, foliaceous, their petiole adnate with the tube of the calyces: corolla long-infundibuliform; limb 5-cleft: anthers quite included: stigmas elevated above the mouth of the tube: berries concrete into a roundish fruit.—*Roxb. fl. Ind.* 1. *p.* 544; (*ed. Wall.*) 2. *p.* 198; *in E. I. C. mus. tab.* 1367; *Ham. in Linn. soc. trans.* 13. *p.* 534; *DC. prod.* 4. *p.* 447; *Spr. syst.* 1. *p.* 750; *Wight! cat. n.* 1318.

The specimen before us was received from Klein's herbarium; we do not know where he obtained it.

1289. (4) M. *exserta* (Roxb.:) arborescent: leaves from broadly-oval to oblong-lanceolate, pointed, tapering at the base: stipules broadly-oval, obtuse, entire or bifid: capituli shortish-peduncled, usually solitary, sometimes in pairs, without bracteas: corolla long-infundibuliform; limb 5-cleft: filaments inserted into the mouth of the tube, between the segments, and with the anthers much exserted: style the length of the tube: drupes concrete into an oval or roundish fruit.—*α*; leaves broadly oval, scarcely tapering at the base, short-petioled, glabrous or pubescent.—M. exserta, *Roxb. fl. Ind.* 1. *p.* 545; (*ed. Wall.*) 2. *p.* 199; *in E. I. C. mus. tab.* 1365; *DC. prod.* 4. *p.* 447; *Spr. syst. suppl. p.* 80.—*β*; leaves oblong or oblong-lanceolate, firm and rigid, attenuated at the base into a longish petiole, glabrous, or hairy in the axils of the nerves underneath.—*Wight! cat. n.* 1319.

We have not seen any authentic specimens of this species, and have referred Wight's cat. n. 1319 to it as a variety, notwithstanding the great difference in the shape of the leaves, on account of the structure of the flower.

Digitized by Google

1290. (5) M. *aspera* (W. & A.:) young branches compressed, covered with harsh pubescence: leaves oblong-lanceolate, acuminated, attenuated at the base, rough on the upper side and on the nerves on the under with very short bristly hairs or points: stipules broadly oval, obtuse, entire or 2-cleft: capituli few-flowered, globose, on short axillary peduncles, ebracteolate: corolla longish-infundibuliform, externally glabrous; limb 5-cleft, the segments unequal: anthers included.—*Wight! cat. n.* 1320.

Our specimens were obtained from Klein's herbarium, and are very imperfect: it appears to approach to *M. Chachuca*, Ham.

1291. (6) M. *stenophylla* (Spr.:) young branches somewhat 4-angled, covered with an ashy-coloured tomentum: leaves elliptic-lanceolate, acuminated at both ends, shortly petioled, clothed on both sides with a very short ashy tomentum: stipules lanceolate, at length reflexed: peduncles axillary, solitary, alternate, tomentose: flowers externally tomentose.—*Spr. syst.* 1. *p.* 749; *DC. prod.* 4. *p.* 448.—M. angustifolia, *Roth, nov. sp. p.* 147 (not *Roxb.*)——Cultivated near Beddir (probably Bednore in Mysore); *Heyne.*

1292. (7) M. *tomentosa* (Heyne:) somewhat arborescent: branches glabrous and shining; young ones 4-angled, tomentose: leaves roundish-ovate, acuminated, often slightly cordate at the base but also tapering into a shortish petiole, shortly tomentose on both sides, particularly underneath and on the nerves above: stipules usually bifid: peduncles axillary, solitary, longer than the petiole, tomentose: capituli ebracteolate, oval, few-flowered.—*Heyne! in Roth, nov. sp. p.* 147; *DC. prod.* 4. *p.* 448; *Wight! cat. n.* 1321.—M. mudia, *Ham. in Linn. soc. trans.* 13. *p.* 536; *DC. l. c.; Spr. syst.* 1. *p.* 749.—Carnatic, *Rottler; Hamilton.*

§ 2. *Corolla shortly infundibuliform, cylindrical below, slightly widened at the mouth, 4- (or occasionally 5-) cleft: stamens 4, or occasionally 5. Peduncles all terminal, 3–10 together, umbellate.*—Padavara, *DC.*

1293. (8) M. *umbellata* (Linn.:) shrubby, glabrous, climbing: leaves from oblong-lanceolate to cuneate-oblong, pointed, usually with a small hairy gland in the axils of the nerves on the under side: stipules membranaceous, united into a truncated sheath: peduncles 3–7, in a sessile terminal umbel, about half the length of the leaves: capituli globose: calyx-margin entire: corolla with a short tube: limb 4- (or occasionally 5-) cleft: filaments short, included, inserted into the bottom of the dilated part of the tube among much hair; anthers exserted.—*Linn. sp. p.* 250; *DC. prod.* 4. *p.* 449; *Spr. syst.* 1. *p.* 750; *Wight! cat. n.* 1322.—M. scandens, *Roxb. fl. Ind.* 1. *p.* 548; (*ed. Wall.*) 2. *p.* 202; *DC. l. c.*—M. Padavara, *Juss. in enc. meth. suppl.* 4. *p.* 5; *Spr. l. c.—Rheed. Mal.* 7. *t.* 27.——Courtallum. Travancore. Malabar.

The number of stamens varies in the same head of flowers, but there are usually only four. That Rheede's Malabar plant and the Ceylon one of Linnæus are identical, might have been readily supposed from the proximity of the two countries, and the correspondence between the descriptions given: but we are not aware of any botanist having hinted at this except Dr Hamilton, in the Lin. soc. trans. 13. p. 533. Roxburgh, when finally leaving India for England, met with it in Ceylon, and the name and short character of it published in the Flora Indica are those sent from thence to one of the editors of that valuable work: had Roxburgh at the time had access to books, he could not have failed to discover the Linnæan synonym. Moon, in his Catalogue of Ceylon plants, trusting to Linnæus' erroneous reference to Rumph. Amb. 3. t. 98, a species allied to, if not the same with, *M. bracteata*, introduces *M. umbellata* entirely on Linnæus' authority, without adding any locality; while Roxburgh's *M. scandens* is mentioned as found at Caltura. Much of the ambiguity as to this plant may have arisen from Linnæus stating that it is

Digitized by Google

erect: herbarium specimens, however, shew its climbing habit only very imperfectly, and often not at all; and besides, Linnæus may have adopted this from Rumphius. Rheede's figure does not represent a climbing plant, but the volume in which it occurs treats only "de fruticibus scandentibus," as parasites, climbers, or plants which require the support of others. Jack, in the Mal. misc. 1. p. 13, and Hook. Bot. misc. 2. p. 67, refers Rheede's figure to his *M. tetrandra*; and except that his plant is stated to be a small diffuse shrub, there is no difference whatever between it and *M. umbellata*: this difference we are even not much inclined to regard as of great consequence, because our plant in particular localities scarcely at all climbs. Perhaps *M. parvifolia*, Bartl., is a mere variety of the same species.

SUBTRIBE 2. GUETTARDEÆ. *DC.*

Flowers distinct and not concrete.

XV. VANGUERIA. *Comm.; Lam. ill. t. 159; Gærtn. fr. 3. t. 193.*

Calyx-tube short, obovate; limb spreading, 5-toothed, deciduous. Corolla globular-campanulate, 5-cleft, with much hair in the throat: lobes ovate or lanceolate, acute, recurved. Stamens 5: filaments very short: anthers oblong, scarcely exserted. Ovary 5-celled, with one ovule in each cell. Style filiform, about the length of the corolla. Stigma exserted, mitriform, or capitate and 5-angled. Berry succulent, not crowned with the calyx but marked with its traces, containing five bony 1-seeded nuts. Seeds attached to the inner angle of each nut near the middle, oblong. Albumen fleshy. Embryo large: cotyledons long, plano-convex; radicle about the length of the cotyledons, superior.—Small trees or shrubs. Leaves petioled, ovate or oblong. Stipules solitary on both sides. Cymes branched, somewhat panicled, axillary, or from the cicatrices of the fallen leaves. Corolla greenish-white. Fruit edible.

* 1294. (1) V. *edulis* (Vahl.:) unarmed: leaves ovate or oblong, membranaceous, glabrous: cymes below the leaves from the old cicatrices: stigma exserted, thick, shortly cylindrical and mitriform.—*Vahl. symb. 3. p. 36.; DC. prod. 4. p. 454; Spr. syst. 1. p. 760; Wight! cat. n. 1323.*—V. cymosa, *Gærtn. fr. p. 75. t. 193.*—V. Madagascariensis, *Gmel. syst. 1. p. 367.*—V. Commersonii, *Desf.; Jacq. hort. Schœnbr. 1. t. 44.*—Vananga chinensis, *Rohr, in Skrift. nat. selsk. Kiovenh. 2. p. 207.*—V. edulis, *Rohr, l. c. p. 208. t. 7.*

We presume this to have been introduced into the Peninsula: there are plants of it in the Missionaries' Garden supposed to have been brought from Batavia. *V. spinosa*, Roxb.! (in E. I. C. mus. tab. 1032), is a distinct species, although united by Sprengel: the branches are sometimes without thorns; the stigma is represented flat and peltate in the drawing, and is described 5-lobed: we find it nearly globose with 5 longitudinal angles or ridges.

XVI. GUETTARDA. *Linn.; Ventn.*

Calyx-ovate or globose: limb tubular, persistent or deciduous, truncated or irregularly toothed. Corolla hypocrateriform: tube cylindrical: lobes 4–9, oval-oblong. Anthers 4–9, sessile in the throat of the corolla, included. Stigma capitate, rarely 2-lobed. Fruit drupaceous, roundish or ovate, crowned with the tube of the calyx: nut obtusely angled, 4–9-celled: cells straight or curved, 1-seeded. Seeds erect, somewhat terete.—Small trees or shrubs. Leaves ovate or lanceolate, rarely cordate. Stipules lanceolate, deciduous,

Digitized by Google

rarely sheathing and truncated. Peduncles axillary, bifid, rarely again bifid. Flowers sessile in the forkings of the peduncle, and unilateral upon its branches.

* 1295. (1) G. *speciosa* (Linn.:) leaves ovate or obovate, often slightly cordate at the base, obtuse at the apex, pubescent on the under side: stipules lanceolate, acuminated, deciduous: cymes peduncled, velvetty, much shorter than the leaf: flowers 4–9-cleft: calyx-limb deciduous: stamens 4–9: drupe depressed, marked by the traces of the calyx; cells of the nut curved.—*Willd. sp.* 4. *p.* 398; *DC. prod.* 4. *p.* 455; *Spr. syst.* 1. *p.* 739; *Lam. ill. t.* 154. *f.* 2; *Roxb. fl. Ind.* 1. *p.* 686; (*ed. Wall.*) 2. *p.* 521; *Wall.! L. n.* 6219; *Wight! cat. n.* 1324.—Cadamba jasminiflora, *Sonner. voy.* 2. *t.* 128.—Gardenia speciosa, *Roxb. in E. I. C. mus. tab.* 33.—Jasminum hirsutum, *Willd. sp.* 4. *p.* 36.—Nyctanthes hirsuta, *Linn. sp. p.* 8.—*Rheed. Mal.* 4. *t.* 47, 48; *Pluk. t.* 397. *f.* 4.

XVII. SANTIA. *W. & A.*

Calyx-tube obovate: limb short, with 5 long subulate teeth, two of them usually approximated or united at the base, the others distinct and distant. Corolla shortly hypocrateriform, shortly villous in the throat and along the lobes: tube about the length of the teeth of the calyx: lobes 5, oblong-patent. Stamens 5: filaments very short: anthers exserted oblong. Ovary crowned with a thick fleshy disk, 3- (or rarely 4-) celled, with one erect linear-oblong ovule in each cell. Style hairy, thicker upwards. Stigma capitate, 3- (occasionally 4-) lobed. Drupe somewhat globose, crowned with the persistent erect teeth of the calyx, containing 3 (or occasionally and rarely 4) deeply rugose bony narrow-oblong slightly curved nuts. Seed somewhat terete, slightly curved. Albumen between fleshy and gelatinous, enclosing the cylindrical embryo.—Shrubby. Branches and young shoots glabrous. Stipules triangular-acuminated, short, caducous, leaving a ring of hair. Leaves short-petioled, elliptic-oblong, shortly pointed, glabrous on the upper side, hirsute on the nerves on the under: nerves prominent on both sides; veins numerous, transverse, prominent particularly on the upper side. Peduncles axillary, short, hirsute bearing at their apex a few (3 or 4) flowers. Calyx and sometimes the corolla sprinkled with stiffish hairs.

The leaves are unlike those of any other *Rubiaceæ* with which we are acquainted: it was sent formerly to Dr Wallich as a doubtful *Spermacoce*, but is not we believe noticed in his List.

1296. (1) S. *venulosa* (W. & A.)—*Wight! cat. n.* 1353.
We have lost our notes of the exact locality.

XVIII. EUPYRENA. *W. & A.*—Pyrostria. *Roxb.* (not *Comm.*)

Calyx-tube obovate: limb small, persistent, 4-toothed, the teeth triangular-acuminated. Corolla infundibuliform, hirsute externally; tube slender; limb 4-cleft: æstivation valvular. Stamens 5: anthers linear, attached by the middle of their back to the throat of the corolla. Ovary 6–12-celled, with one ovule in each cell. Style shorter than the tube, filiform. Stigma simple (neither capitate nor cleft). Drupe globose, with 6–12 furrows, crowned at the very apex with the teeth of the calyx, containing 6–12 slightly curved 1-seeded bony distinct nuts. Seeds cylindric. Albumen fleshy.—Shrubs or small trees. Leaves shortly petioled. Stipules from a broad base. Peduncles

Digitized by Google

towards the extremities of the branches axillary, opposite and springing from within the stipules, once or twice bifid, with the flowers unilateral and sessile along its branches. Bracteas small, solitary under each flower.

The stipules having a broad base, inclose, as it were, the base of the peduncles: we presume this to be what was intended by Roxburgh in his Flora Indica, where it is printed ; peduncles opposite, with the stipules many times longer than the petioles, each ending, &c.: instead of; peduncles opposite, within the stipules, many times longer, &c. In his List, however, under No. 6217, Dr Wallich doubts if Roxburgh's plant be not the same as *Timoneus Rumphii*, DC.

1297. (1) E. *glabra* (W. & A.;) young shoots glabrous: stipules deciduous, shorter than the petioles: leaves oval-lanceolate, acuminated at both ends, glabrous; the midrib and nerves underneath sprinkled with hairs: drupe with 8–12 nuts.—*Wight! cat. n.* 1326.

Obtained without any specified locality from Klein's herbarium.

XIX. HAMILTONIA. *Roxb.* (not *Muhl.*).—Spermadictyon. *Brown.*

Calyx-tube ovate: limb 5-partite ; segments subulate, persistent. Corolla infundibuliform, densely pubescent: tube long, straight: lobes 5, oblong. Stamens 5, inserted into the throat, included: anthers linear: stigma 5-cleft. Capsule crowned with the calyx, dehiscing at the apex, containing 5 nuts. Nuts triquetrous, 1-seeded. Seeds erect from the base of the nut, covered with a dry reticulated membrane. Albumen very thin. Embryo erect: radicle oblong: cotyledons foliaceous, cordate.—Shrubs. Leaves lanceolate. shortly petioled. Stipules short, acute, broad at the base, adpressed. Flowers fascicled or umbelled.

1298. (1) H. *Mysorensis* (W. & A.:) stems glabrous: leaves oblong- or oval-lanceolate, with a short rigid pubescence or nearly glabrous, reticulated on the under side: panicles corymbose, trichotomous, pubescent: flowers capitate: calyx-segments with a few distant subulate gland-tipped teeth on the margin.—*Wight! cat. n.* 1325.——Mysore; *Heyne*, 20th December 1801.

XX. EPITHINIA. *Jack.*

Calyx-tube somewhat cylindrical: limb membranaceous, cup-shaped, entire or inconspicuously 4-toothed. Corolla hypocrateriform, glabrous externally; tube 2–3 times longer than the limb of the calyx, hairy on the inside from the mouth to near the base: limb 4-partite, segments ovate, recurved: æstivation imbricative and a little twisted. Ovary 2-celled: ovules two in each cell, the one above the other; the upper one pendulous from the apex of the cell. Stamens 4, exserted: anthers linear, pointed. Style filiform, glabrous, exserted, as long as the corolla. Stigma bifid; divisions linear, spreading. Fruit drupaceous, oblong-clavate, a little compressed, marked with 8 longitudinal furrows, crowned with the persistent calyx-limb, containing two 1-celled (or by cohesion one 2-celled) woody hard long nuts. Seeds 2 in each cell (the one above the other), or solitary from abortion, linear-oblong. Embryo large in a thinnish fleshy albumen: cotyledons oblong, flattish: radicle superior.—Shrubby, glabrous, exuding gum from the extremities of the young shoots. Stipules adpressed, connate, sheathing, truncated. Leaves petioled, obovate, obtuse, somewhat fleshy, with nerves and veins inconspicuous. Cymes a little above the axils, on short horizontal peduncles, bifid, shorter than the petioles. Flowers white.

In some few trivial points our description differs from that given by Jack, but we

Digitized by Google

suspect that they form but one species: Jack says there are no stipules, and that the peduncles are many-flowered: in our specimens there are certainly stipules, and the cymes are short and seldom bear more than 10 or 20 flowers. In the only ripe fruit we have seen, there appeared to be one hard nut with 2 cells, but as it is not improbable that the normal state is to have 2 one-celled nuts, we have followed Jack in that particular.

1299. (1) E. *Malayana* (Jack).—*Jack in Mal. misc.* 1. *p.* 12; *Hook. Bot. misc.* 2. *p.* 67; *DC. prod.* 4. *p.* 477; *Wight! cat. n.* 1345.——Mangrove swamps.

Our specimens of this plant are from the Madras herbarium, and were named *Lumnitzera racemosa*, to the leaves of which those of the present plant bear a strong resemblance: in the same sheet were a few leaves and flowers of the true *Lumnitzera*, so that we have no doubt but that the two had been gathered at the same time and in similar situations, but we do not know the precise locality.

TRIBE V. PÆDERIEÆ. *DC.*

Fruit 2-celled, indehiscent but scarcely fleshy, the outer coat (tube of the calyx) separating readily from the carpels: carpels compressed, 1-seeded, pendulous from a filiform axis. Albumen fleshy.—Climbing shrubs with opposite leaves and interpetiolar stipules.

XXI. PÆDERIA. *Linn.; Lam. ill. t.* 166. *f.* 1; *Gærtn. fr.* 3. *t.* 195.

Calyx-tube ovate: limb small, 5- (or rarely 4-) toothed, persistent. Corolla infundibuliform, hirsute internally, 5- (or rarely 4-) lobed, with a plicate æstivation. Stamens 5, sometimes abortive: anthers oblong, almost sessile on the middle of the tube. Style not exserted. Stigma bifid. Berry small, ovate-globose, 2-celled, 2-seeded; the outer-coat at length brittle. Albumen fleshy. Embryo straight: radicle terete, inferior: cotyledons flat, foliaceous, large: plumule inconspicuous.—Climbing shrubs. Leaves opposite, petioled, lanceolate, ovate or cordate, acute. Stipules solitary on each side. Peduncles terminal and axillary, branched, somewhat corymbose. Flowers small, white, often dicœcious from abortion.

The erect species, *P. recurva*, Roxb., *P. erecta*, Roxb., and *P. ternata*, Wall. belong neither to the present genus nor tribe of *Rubiaceæ*: the horny albumen, and seeds grooved on the inner side, at once shew their affinity with the subtribe *Coffeeæ*. We also reject *P. Valli-Kara*, Juss., a plant only known from Rheede's plate and description, the one contradicting the other in many particulars: the author seems to have had before him two widely different plants, neither of which perhaps belongs to *Rubiaceæ*.

* 1300. (1) P. *fœtida* (Linn.:) leaves oblong or lanceolate, cordate at the base, glabrous: panicles axillary and opposite, or terminal: flowers sessile along the ultimate divisions: bracteoles minute: berry ovate, somewhat compressed.—*Linn. mant. p.* 52; *DC. prod.* 4. *p.* 471; *Spr. syst.* 1. *p.* 668; *Roxb. fl. Ind.* 1. *p.* 683; (*ed. Wall.*) 2. *p.* 517; *Wall.! L. n.* 6247; *Wight! cat. n.* 1327.—Psychotria volubilis, *Roxb. in E. I. C. mus. tab.* 1030.—Apocynum fœtidum, *Burm. Ind. p.* 71.—*Rumph. Amb.* 5. *t.* 160.

Our specimens are from Klein's herbarium. Roxburgh says that the seed is surrounded with a membranaceous wing: but it is the carpel detached from the tube of the calyx, and not the seed, he describes. Neither Lamarck's nor Gærtner's figures are good.

Digitized by Google

TRIBE VI. COFFEACEÆ. *DC.*

Fruit 2-celled, baccate, containing two 1- (or rarely 2-) seeded bony or crustaceous nuclei that are flattish or grooved on the inner side, often marked with a furrow on the outer, rarely with only one nucleus (and probably so from abortion), containing an erect or depressed or laterally attached seed. Albumen horny, sometimes somewhat cartilaginous.—Trees or shrubs. Leaves opposite. Stipules interpetiolar, two on both sides, and either distinct or combined.

XXII. CANTHIUM. *Lam.; Gærtn. fr.* 3. *t.* 196.

Calyx-tube ovate; limb short, 4–5-toothed. Corolla with a short tube, bearded in the throat; lobes 4–5, spreading. Anthers 4–5, inserted into the throat, scarcely exserted. Style filiform exserted. Stigma thick, ovate-globose or mitriform, undivided or bifid at the apex. Drupe globose or compressed, crowned with the (sometimes inconspicuous) calycine teeth, fleshy, 2-celled. Seeds solitary in each cell, inserted near the apex, inverted, incurved. Albumen fleshy. Embryo central: radicle long, superior.—Shrubs, with branches unarmed or thorny. Leaves opposite, somewhat coriaceous. Stipules interpetiolar, solitary on both sides. Peduncles axillary, short, several-flowered.

One of the cells in all the following species is occasionally abortive, whence we have little doubt but *C. anomocarpum*, DC., is a mere state of some more perfect plant.

1301. (1) C. *didymum* (Gærtn.:) shrubby, unarmed: leaves short petioled, oval, more or less acuminated, glabrous, coriaceous; the upper side shining; under with glandular hollows in the axils of the nerves: cymes axillary, peduncled, much shorter than the leaves: calyx-limb with 5 often inconspicuous teeth: tube of the corolla furnished on the inside with rigid scariose hairs pointing downwards: stamens 5: stigma much exserted, ovate, mitriform, slightly 2-lobed at the apex: drupe (when mature) compressed and somewhat didymous, broadly obovate and slightly emarginate, wrinkled and tubercled, marked with a furrow on each side.—*Gærtn. fr.* 3. *p.* 94. *t.* 196; *DC. prod.* 4. *p.* 473; *Roxb. fl. Ind.* 1. *p.* 535; (*ed. Wall.*) 2. *p.* 171; *Wight! cat. n.* 1328.—C. cymosum, *Pers. syn.* 1. *p.* 200.—Psydrax dicoccos, *Gærtn. fr.* 1. *p.* 125. *t.* 26. *f.* 2; *DC. l. c. p.* 476.—Webera cymosa, *Willd. sp. p.* 1224.—Rondeletia cymosa, *Poir. enc. meth.* 6. *p.* 256.—Cupia cymosa, *DC. l. c. p.* 394.—Gardenia parviflora, *Poir. suppl.* 2. *p.* 708 (not *Kunth* nor *Smeathm*).—G. Naum-papata, *Roxb. in E. I. C. mus. tab.* 15.—*α*; young shoots and inflorescence softly pubescent.—*β*; young shoots and inflorescence glabrous.

Gærtner's figure of the fruit (under *Psydrax dicoccos*) is much better than that given by his son; but this part presents very different appearances according to the stage of growth: at first it is globose without any trace of tubercles; it afterwards dilates laterally, though still smooth, and finally the nuclei become wrinkled both externally and internally, marking the seed in the same way. We have never observed it so deeply emarginate as in t. 196. of Gærtner, although we know our plant to be identical with Roxburgh's and the Missionaries', preserved in the Banksian herbarium (from which he obtained his specimen) under the name of *Webera cymosa*. We scarcely understand why De Candolle should have kept *Web. cymosa* (under *Cupia*), when Chamisso and Schlechtendal had already (Linnæa, 4. p. 15), from actual examination, determined it to be *C. didymum*. The minute calycine-teeth do

Digitized by Google

not fall off, nor is the stigma composed of two distinct plates, as in Richard's generic character of *Psydrax*, probably derived from his other species from Madagascar, and which perhaps ought still to be removed from *Canthium*.

†* 1302. (2) C. *nitens* (DC.:) unarmed, glabrous: leaves petioled, broadly ovate, somewhat obtuse, upper side very shining: racemes compound, axillary, many-flowered, a little longer than the petiole: tube of the corolla a little longer than the lobes; lobes oval, obtuse: stamens 4: stigma thick, ovate, much protruded.—*DC. prod.* 4. *p.* 474.

Collected by Leschenault in India, but perhaps not in the Peninsula: if however it be so, we suspect it must be an accidental tetrandrous form of *C. didymum*, a plant which otherwise does not appear to have been ever seen by De Candolle, although occurring in various parts through which Leschenault travelled.

1303. (3) C. *parviflorum* (Lam.:) shrubby, usually with opposite horizontal thorns a little above the axils, sometimes with the branches nearly unarmed: leaves ovate, glabrous, often fascicled on the young shoots: racemes short, axillary, few-flowered: stamens 4: stigma somewhat globose, often more or less bifid or marked with a longitudinal furrow: drupe obovate, slightly emarginate, compressed, furrowed on each side.—*Lam. enc. meth.* 1. *p.* 602; *DC. prod.* 4. *p.* 474; *Spr. syst.* 1. *p.* 756; *Gærtn. fr.* 3. *t.* 196; *Roxb. Cor.* 1. *t.* 51; *fl. Ind.* 1. *p.* 534; (*ed. Wall.*) 2. *p.* 170; *Wight! cat. n.* 1329.—Webera tetrandra, *Willd. sp.* 1. *p.* 1224.—*Rheed. Mal.* 7. *t.* 36; *Pluk. t.* 97. *f.* 4.

The size of the leaves and length of the petioles and thorns are very variable. The structure of the flower is by no means alike in all: in some specimens the calyx-teeth are oblong, somewhat foliaceous and recurved; the tube of the corolla short, and the segments very woolly inside, the stamens scarcely exserted and hidden by the wool of the throat, style longer than the tube, stigma capitate and 2-lobed: in others the calyx-teeth are small ovate and pointed, the tube of the corolla longer and less woolly and its segments glabrous, anthers exserted, style longer than the tube, stigma capitate entire grooved longitudinally with a sharp angle between the grooves: but although these differences may be constant among specimens taken from the same bushes, we are not prepared to assert that they are sufficiently so, speaking generally, to serve as marks for varieties: we have ourselves observed several intermediate forms.

1304. (4) C. *Rheedei* (DC.:) shrubby, armed with supra-axillary thorns: branches hirsute: leaves ovate- or oval-lanceolate, acuminated, very shortly petioled, upper side shining, under with a tuft of hairs in the axils of the nerves: flowers axillary, shortly pedicelled, few, fascicled or in a very short raceme: calyx-teeth minute: corolla in æstivation acuminated; tube shortly campanulate, lobes acuminated: stamens 5: stigma mitriform: drupe obovate, emarginate.—α; leaves oval-lanceolate, acutish at the base, hirsute on the under side.—C. Rheedei, *DC. prod.* 4. *p.* 474.—*Rheed. Mal.* 5. *t.* 37.—β; leaves ovate-lanceolate, broad at the base, sprinkled with short bristly hairs on the under side.—*Wight! cat. n.* 1330.—γ; leaves ovate-lanceolate from a slightly cordate base, glabrous on both sides.—*Wight! cat. n.* 1331.

Our specimens of γ are from Rottler's herbarium, and were gathered at Columbo in Ceylon in April 1806.

1305. (5) C. *Leschenaultii* (W. & A.:) shrubby, climbing?, quite glabrous: old branches armed with short supra-axillary thorns; young shoots long, slender, often unarmed: petioles shortish, twisted: leaves opposite or 3–4-verticillate, oblong, much acuminated, acute at the base: cymes axillary, short-peduncled, few- (3–5-) flowered: calyx minutely 5-toothed: corolla in æstivation acuminated; tube campanulate, with a ring of reflexed hairs internally; segments of the limb 5, linear-lanceolate, acuminated, reflexed: stamens 5; anthers exserted, afterwards reflexed: style thickened about the

Digitized by Google

middle and hairy downwards: stigma mitriform, bifid to about the middle: drupe obcordate.—*Wight! cat. n.* 1332.—Dondisia Leschenaultii, *DC. prod.* 4. *p.* 469 (descr. of ovary bad).——Courtallum mountains.

De Candolle's description under *Dondisia* is exceedingly good, except what relates to the structure of the ovary (about which however he appears very uncertain), and the absence of thorns.

XXIII. IXORA. *Linn.; Gærtn. fr. t.* 25.

Calyx-tube ovate; limb small, 4-toothed or 4-partite. Corolla hypocrateriform; tube slender, terete, longer than the lobes: limb 4-partite, spreading. Anthers 4, somewhat sessile in the throat, or on short filaments. Style shorter than the corolla, usually scarcely exserted beyond the tube, bifid at the apex; divisions of the stigma diverging or revolute. Berry drupaceous, crowned with the persistent calyx, somewhat globose, 2-celled: nuts chartaceous, flat or concave on the inner side, gibbous on the back, 1-seeded. Albumen cartilaginous, solid. Embryo dorsal, erect, incurved: radicle long: cotyledons foliaceous.—Shrubs or small trees. Leaves opposite. Stipules from a broad base, acute or ending in a setaceous simple or bifid awn. Corymbs terminal, usually trichotomous. Flowers red or white, often fragrant.

1306. (1) I. *coccinea* (Linn.:) shrubby, glabrous: leaves nearly sessile, oval or oblong, with a more or less cordate base, or cuneate-obovate, acute or acuminated, mucronate, coriaceous, shining on the upper surface: corymb nearly sessile, thin: lobes of the calyx acute, connivent in fruit: corolla (scarlet) with a long tube, the segments ovate-lanceolate or elliptical, acute: style shortly exserted: divisions of the stigma oblong-linear.—*Linn. sp. p.* 159 (excl. syn.); *Sm. in Rees' cycl.; Roxb. fl. Ind.* 1. *p.* 375; (*ed Wall.*) 1. *p.* 385; *in E. I. C. mus. tab.* 166; *Wight! cat. n.* 1333.—I. grandiflora, *DC. prod.* 4. *p.* 486 (perhaps not of *Ker*); *Spr. syst.* 1. *p.* 407; *Wight! in Hook. bot. misc.* 3. *p.* 294. *suppl. t.* 35.—I. propinqua, *Brown in Wall.! L. n.* 6119.—I. obovata, *Heyne? in Roth, nov. sp. p.* 90.—Ixora n. 22, *Linn. fl. Zeyl.—Rheed. Mal.* 2. *t.* 12; *Burm. Zeyl. t.* 57; *Pluk. t.* 59. *f.* 2, *and t.* 109. *f.* 2?

We restore the name given by Linnæus, as this is the species with large red flowers originally described by him in the flora Zeylanica. We do not see how *I. grandiflora* of Ker, bot. reg. t. 154. differs, but we presume that Brown must have considered it distinct when he proposed a new appellation for our plant. The shape of the leaves is very inconstant often on the same specimen; sometimes they resemble so exactly Pluk. t. 109. f. 2, that we have adduced that figure here although Plunkenet seems to say it has white flowers, but this part of his description appears to have been borrowed from Bauhin, and not derived from his own observations. We have some hesitation about bringing here *I. obovata*, but Roth's description agrees well with some states of this species, except where he says the lobes of the corolla are obtuse; De Candolle refers it to *I. Bandhuca*, which, however, is not found in the Peninsula; Sprengel considers it synonymous with *I. cuneifolia*, but that has much smaller and differently coloured flowers.

1307. (2) I. *stricta* (Roxb.:) shrubby, glabrous; branches straight: leaves somewhat sessile, lanceolate-oblong, corymbs dense, compound, somewhat hemispherical: calyx-lobes broadly ovate, somewhat obtuse: corolla (pale pink, orange, or scarlet) with a long tube, the segments roundish, obtuse: anthers pointed: style glabrous, slightly exserted; divisions of the stigma linear-oblong.—*Roxb. fl. Ind.* 1. *p.* 379; (*ed Wall.*) 1. *p.* 384; *in E. I. C. mus. tab.* 1337; *DC. prod.* 4. *p.* 486; *Spr. syst.* 1. *p.* 407; *Wall.! L. n.* 6123; *Wight! cat. n.* 1334.—I. coccinea, *Ait.* (not *Linn.*) *curt. bot. mag. t.* 169.—

Digitized by Google

I. speciosa, *Willd. enum.* 1. *p.* 157.—I. flammea, *Salisb.*—I. incarnata, *Roxb. mst; herb. Madr.!; Smith in Rees' cycl.; Roem. and Schult. syst.* 3. *p.* 179 (excl. syn.)

Our specimens are from the Madras herbarium, and most probably cultivated. The flowers are much smaller than in the last species.

1308. (3) I. *Wallichii* (W. & A.:) shrubby: young shoots and branches of the corymb pubescent: leaves lanceolate-oblong, acuminated, shortly petioled, coriaceous; upper side glabrous and shining; under strongly nerved, pubescent: stipules with a laterally-compressed subulate long point: corymbs trichotomous, branched, open; flowers crowded on the ultimate divisions: calyx-segments as long as the tube, narrow-oblong: corolla (pale red?) with a slender tube (an inch and a quarter long); lobes narrow-oblong, soon reflexed, obtuse: style glabrous, much exserted; divisions of the stigma linear, recurved.—I. undulata, *Wall.! L. n.* 6129. *d* (not *Roxb.*).

Although Dr Wight sent this to Dr Wallich, he has not retained a specimen in his own herbarium; our character is therefore taken from one belonging to Dr Hooker.

1309. (4) I. *nigricans* (Br.:) shrubby, glabrous: leaves oblong-lanceolate, shortly petioled, shining on both sides, turning black by drying: stipules with a subulate point: corymbs trichotomous, large, open; flowers lax: calyx-segments subulate, about the length of the tube: corolla (white) with the tube (three-quarters of an inch long) slightly widened upwards; lobes oblong, slightly acute, recurved: filaments shortly exserted: style glabrous, considerably exserted: divisions of the stigma filiform: berry globose.—*Brown in Wall.! L. n.* 6154; *Wight! cat. n.* 1335.

This was sent to Dr Wallich by Dr Wight, but is not noticed under any of the letters of n. 6154; it perhaps, therefore, forms another species in the List, although we cannot see any difference between it and *I. nigricans*.

1310. (5) I. *undulata* (Roxb.:) shrubby: leaves broadly lanceolate, much waved on the margin, glabrous: corymbs trichotomous, decompound, open; branches pubescent: flowers (small and white) numerous at the extremities of the ultimate divisions; calyx-segments short-lanceolate, acute: lobes of the corolla narrow-oblong, reflexed: filaments exserted: style glabrous, scarcely exserted; divisions of the stigma linear, recurved: berries transversely oval.—*Roxb. fl. Ind.* 1. *p.* 385; (*ed Wall.*) 1. *p.* 395; *in E. I. C. mus. tab.* 913; *Roth. nov. sp. p.* 91; *DC. prod.* 4. *p.* 488; *Spr. syst.* 1. *p.* 408; *Wall.! L. n.* 6129. *a, c.*——Peninsula? *Heyne.*

Probably transmitted by Roxburgh to Heyne, and therefore not a native of the Peninsula. The leaves are generally said to be nearly sessile, but in a specimen from Dr Wallich in Dr Hooker's herbarium, the petioles are nearly an inch long.

1311. (6) I. *Notoniana* (Wall.:) shrubby: leaves obovate-oblong, shortly pointed, glabrous: corymbs long-peduncled, trichotomous; primary branches distant and horizontal, glabrous; ultimate ones more or less pubescent, with numerous flowers: calyx-segments oblong-linear, twice the length of the tube: corolla (red) with a short (scarcely half an inch long) tube, a little hairy in the mouth; lobes oval, obtuse, spreading: style shortly exserted; divisions of the stigma linear-oblong.—*Wall.! L. n.* 6132; *Wight! cat. n.* 1336, 1337?——Neelgherries.

No. 1337 is in fruit: corresponding specimens of it were likewise sent to Dr Wallich, but we do not know whether he considered them the same with *I. Notoniana* or another species.

1312. (7) *I. cuneifolia* (Roxb.:) shrubby: leaves oblong-lanceolate, more or less cuneate at the base, pointed, glabrous: corymbs trichotomous, open; flowers (small and whitish) fascicled at the extremities of the ultimate subdivisions: segments of the calyx narrow-oblong, thrice the length of the tube:

Digitized by Google

tube of the corolla slender (more than half an inch long); lobes oval, obtuse: filaments slightly exserted; divisions of the stigma linear, recurved: berry roundish-turbinate.—*Roxb. fl. Ind.* 1. *p.* 380; (*ed Wall.*) 1. *p.* 390; *in E. I. C. mus. tab.* 1785; *DC. prod.* 4. *p.* 487; *Spr. syst.* 1. *p.* 408; *Wall.! L. n.* 6140; *Wight! cat. n.* 1338?

Our doubts about Dr Wight's plant arise from two grounds: corresponding specimens were sent to Dr Wallich, but they are not referred to under *I. cuneifolia*; and, secondly, Roxburgh describes the corymb long-peduncled, while in the specimen before us it is sessile, inasmuch as the three primary branches are subtended by two leaves; but in Roxburgh's drawing it is represented as in our plant. The three branches of the corymb may, indeed, be viewed as three peduncled distinct corymbs, two in the axils of the uppermost pair of leaves, and one terminal between them, so that we are inclined to believe the difference lies principally in words. Perhaps Dr Wight's specimens form *I. Wightiana*, Wall. L. n. 6161. *a.*

1313. (8) I. *brachiata* (Roxb.:) shrubby with opposite spreading branches: leaves shortly petioled, lanceolate-oblong, obtuse, tapering at the base, glabrous: stipules triangular, acute: corymbs sessile, trichotomous, open; primary branches long, the lateral ones horizontal; flowers (small, white) numerous on the ultimate divisions: calyx with 4 small broad acute teeth: tube of the corolla (3–4 lines long) slender; lobes obovate, retuse, during æstivation forming a globose head: anthers sessile: style scarcely exserted, glabrous; divisions of the stigma oblong, short, erect.—*Roxb. fl Ind.* 1. *p.* 382; (*ed Wall.*) 1. *p.* 391; *in E. I. C. mus. tab.* 1942; *DC. prod.* 4. *p.* 488; *Spr. syst.* 1. *p.* 408; *Wall.! L. n.* 6142.—I. micrantha, *Heyne.*—Pavetta breviflora, *DC.? l. c. p.* 491.

1314. (9) I. *parviflora* (Vahl:) arboreous: leaves short-petioled, from linear-oblong to cuneate-obovate, bluntish or with a short point, often slightly cordate at the very base, coriaceous and hard, shining: stipules with a long subulate point: corymbs or panicles terminal, trichotomous, sessile or peduncled, with often foliaceous bracteas subtending the primary branches: flowers (small and white) crowded on the extreme subdivisions: calyx with 4 obtuse small teeth: corolla (scarcely half an inch long) with a slender tube; lobes oblong-linear, obtuse, reflexed, forming an oval head during æstivation: style hairy!, exserted; divisions of the stigma oblong, erect: berry somewhat didymous.—*Vahl, symb.* 3. *p.* 2. *t.* 52; *DC. prod.* 4. *p.* 488; *Spr. syst.* 1. *p.* 408; *Roxb. fl. Ind.* 1. *p.* 383; (*ed Wall.*) 1. *p.* 393; *Wall.! L. n.* 6156; *Wight! cat. n.* 1339; *in Hook. bot. misc.* 3. *p.* 292. *suppl. t.* 34.—I. alba, *Roxb. in E. I. C. mus. tab.* 167; *Smith in Rees' cycl.*—I. arborea, *Smith! in Rees' cycl.*; *DC. l. c.*—I. Pavetta, *Andr. bot. rep. t.* 78; *Pers. syn.* 1. *p.* 130; *Spr. l. c.*—I. decipiens, *DC. l. c.*—Webera corymbosa, *herb. Sm.!* (not in *Rees' cycl.*)

Vahl's figure is exceedingly characteristic of some states of our plant, nor do we well understand why Smith on the one hand, and De Candolle on the other, have each erected Roxburgh's plant into a distinct species. It is readily recognised, whatever be the shape of its leaves or size of the panicle, by its small white flowers and hairy style. De Candolle says that the flowers are scarlet, but, at the same time, places it among the species with white flowers: they are pure white, but become reddish by drying.

1315. (10) I. *lanceolaria* (Colebr.:) shrubby: branches slender, drooping, glabrous: leaves short-petioled, spreading, approximate, narrow or oblong-lanceolate, acuminated; upper surface dull, glaucous, glabrous; under pale, glabrous or pubescent; corymbs small, few-flowered, sessile, trichotomous, open: flowers (white) lax: calyx-segments linear-oblong, much longer than the tube, connivent in fruit: tube of the corolla (about three-quarters of an inch long) slender; lobes spreading, linear-oblong, obtuse, a

Digitized by Google

little falcate, slightly pubescent: ovary crowned with a series of fleshy sphacelate bristles round the inside of the limb of the calyx: filaments shortly exserted; anthers long-linear, the base bifid and ending in 2 subulate spine-like processes; style much exserted; divisions of the stigma long-linear, spreading: berry somewhat didymous.—*α*; leaves narrow-lanceolate, much acuminated, quite glabrous.—*Wight! cat. n.* 1340.—I. lanceolaria, *Roxb. fl. Ind.* 1. *p.* 387; (*ed Wall.*) 1. *p.* 397; *DC. prod.* 4. *p.* 488; *Spr. syst.* 1. *p.* 409; *Wall.! L. n.* 6125.—*β*; leaves oblong-lanceolate, shortly acuminated, sometimes pubescent on the underside.—*Wight! cat. n.* 1341.—I. leucantha, *Heyne; Wall.! L. n.* 6148.—*Rheed. Mal.* 2. *t.* 14?——Travancore.

These two varieties agree in all the remarkable points of structure, and only differ in pubescence and shape of the leaves, characters of minor importance. We hope that we have at length found a resting place for Rheede's figure, which, along with Plunkenet's t. 109. f. 2, were adduced by Linnæus under his *I. alba:* may not our var. *β.* be likewise the Linnæan plant?; no specimens of it exist in his own herbarium, so that Hermann's must settle the dispute; Smith considers it to have been taken up from Rheede's figure. *I. alba* of Roxburgh (in E. I. C. mus. tab. 911), and Wall.! L. n. 6122, appears to be, as Roxburgh himself supposes, a white flowered state of *I. stricta.*

†1316. (11) I. *elongata* (Heyne.)—*Wall. L. n.* 6131.

†1317. (12) I. *puberula?* (Wall.)—*Wall. L. n.* 6145. *c.*

†1318. (13) I. *corymbosa* (Heyne.)—*Wall. L. n.* 6155.

†1319. (14) I? *arguta* (Br.)—*Wall.! L. n.* 6157.

†1320. (15) I. *Wightiana* (Wall.)—*Wall. L. n.* 6161.

Of this we have not seen the letter *a*, but have already hinted that it may be the same as *I. cuneifolia*, Wight's cat. n. 1338: of *b*, Dr Hooker has obligingly sent us his specimen for examination, but as it is very imperfect, we cannot determine to which it ought to be referred. We may remark here that there is some confusion about Dr Wallich's synonyms: thus, he quotes in this place the *I. stricta* of Wight's herbarium: now, we have before us specimens corresponding to what was so named and sent, and these are the same with *Pavetta Wightiana*, Wall.! (a mere narrow-leaved state of *Stylocoryne Webera.*)

†1321. (16) I. *paniculata* (Rottl.)—*Wall. L. n.* 6163.

†1322. (17) I. *attenuata* (Wall.)—*Wall. L. n.* 6164.

XXIV. PAVETTA. *Linn.; Gærtn. fr.* 1. *t.* 25.

Calyx-tube ovate; limb small, 4-toothed. Corolla hypocrateriform; tube cylindrical or clavate, longer then the 4-partite limb: lobes spreading, more or less unequal. Anthers 4, somewhat sessile in the throat of the corolla. Style filiform, at length much exserted and longer than the corolla, entire, clavate. Stigma undivided. Berry drupaceous, crowned with the persistent limb of the calyx, globose, 2-celled: cells 1-seeded. Albumen cartilaginous, solid. Embryo dorsal, erect, incurved: cotyledons foliaceous: radicle long. —Shrubs. Leaves opposite. Stipules with a subulate point. Corymbs terminal or from the upper axils, often trichotomous. Flowers white.

We omit here *P. angustifolia*, Roem. and Sch., or *P. Indica*, Burm. Ind. t. 13. f. 3. (not Linn.), and *P. amplexicaulis*, Pers., neither of which we have reason to believe are natives of the Peninsula; besides, the descriptions hitherto given are much too imperfect to permit of our ascertaining what they are. We pass over likewise *P. sumatrensis* of Heyne and Roth, because the name indicates it to have been found in Sumatra: this has 5 stamens and lobes to the corolla, and is apparently *P. bar-*

Digitized by Google

bata, Smith! in Rees' cycl., which De Candolle refers to *Polyosus*, but which seems to us rather referable to *Cupia* or *Stylocoryne*.

1323. (1) P. *Indica* (Linn.:) leaves oval-oblong, acuminated, tapering at the base, petioled, upper surface glabrous and shining: stipules broad, upper ones often concrete at the base: corymbs terminal and from the upper axils, their primary ramifications opposite: flower-bud gradually thicker upwards: calyx-teeth minute: lobes of the corolla 2–3 times shorter than the tube, oval, obtuse: style twice the length of the corolla, glabrous: stigma clavate, hispid.—*Linn. sp. p.* 160; *DC. prod.* 4. *p.* 490; *Spr. syst.* 1. *p.* 407; *Wall.! L. n.* 6175; *Wight! cat. n.* 1342.—P. alba, *Vahl, symb.* 3. *p.* 11.—Ixora paniculata, *Lam. enc. meth.* 3. *p.* 344.—I. pavetta, *Roxb. fl. Ind.* 1. *p.* 386; (*ed. Wall.*) 1. *p.* 395.—I. Nunypapata, *Roxb. in E. I. C. mus. tab.* 168.—*Rheed. Mal.* 5. *t.* 10; *Pluk. t.* 367. *f.* 5.

There are occasionally 5 lobes to the corolla, and 5 stamens. The leaves on the under side, and the young shoots, are either pubescent or glabrous. *P. polyantha*, Br. in Wall.! L. n. 6176, appears scarcely distinguishable except by the rather smaller lobes of the corolla.

1324. (2) P. *hispidula* (W. & A.) branches, divisions of the corymb, and calyx densely pubescent: leaves short-petioled, narrow, oblong-lanceolate, acuminated at both ends; upper side hispidly pubescent; under tomentose: corymbs sessile, not much divided, with the primary branches short: flowers on longish pedicels, lax: calyx-teeth acute, recurved: corolla glabrous externally and in the throat; the lobes 2–3 times shorter than the tube, linear-oblong, obtuse, recurved: style more than twice the length of the corolla, thickened about the middle, glabrous: stigma clavate, slightly hispid.—*Wight! cat. n.* 1343.

The corolla is larger than in the last species.

1325. (3) P. *tomentosa* (Smith:) young branches, divisions of the corymb, and calyx densely pubescent: leaves longish-petioled, cuneate-obovate, ovate or occasionally oblong; upper side thinly tomentose or harshly velvetty; under densely tomentose: corymbs panicled, large, lax; flowers longish pedicelled: calyx-teeth small, acute: corolla glabrous externally and in the throat; the lobes more than half the length of the tube, oval, spreading: style about a half longer than the corolla, and with the clavate stigma hairy.—*Smith in Rees' cycl.; Heyne in Roth, nov. sp. p.* 88; *DC. prod.* 4. *p.* 490; *Spr. syst.* 1. *p.* 407; *Wall. L. n.* 6173; *Wight! cat. n.* 1344.—I. velutina, *Wall.! L. n.* 6174.—Ixora tomentosa, *Roxb. fl. Ind.* 1. *p.* 386; (*ed. Wall.*) 1. *p.* 396; *in E. I. C. mus. tab.* 169.

In our specimens the corolla had dropped off; we have taken our description of it from Roxburgh and Roth: in Roxburgh's drawing it is not represented one-half so large as in either of the preceding species.

1326. (4) P. *Rothiana* (DC.:) young branches, divisions of the corymb, and calyx densely pubescent: leaves petioled, elliptical, sprinkled with short hairs on both sides, whitish and tomentose when young: corymbs somewhat panicled, 3–4 times trichotomous: calyx-teeth minute, triangular: corolla glabrous externally, bearded in the throat; lobes oblong, very obtuse: style slender, twice the length of the corolla, and with the stigma glabrous.—*DC. prod.* 4. *p.* 491.—P. villosa, *Heyne* (not *Vahl*); *Roth, nov. sp. p.* 88; *Spr. syst.* 1. *p.* 407.

This we have not seen: it appears to come very close to *P. tomentosa*.

†1327. (5) P. *lucens* (Br.)—*Brown in Wall. L. n.* 6168.

†1328. (6) P. *Brunonis* (Wall.)—*Wall. L. n.* 6172.——Neelgherries.

Digitized by Google

XXV. GRUMILEA. *Gærtn. fr.* 1. *t.* 28. *f.* 2.

Calyx-tube obovate, very short; limb cup-shaped, truncated and 5-toothed. Corolla infundibuliform; tube short, villous in the mouth: limb 5-partite, segments incurved at the point: æstivation valvular. Stamens 5, inserted upon the tube: filaments short: anthers oblong, exserted. Style filiform, the length of the tube or of the corolla, surrounded at the base by a short cylindrical or 5-lobed fleshy disk. Stigma bipartite (occasionally 3-partite); divisions thick. Berry crowned with the converging limb of the calyx, ovate-globose, somewhat coriaceous, 2- (or occasionally 3- sometimes from abortion 1-) celled. Seeds solitary in each cell, plano-convex or angled. Albumen somewhat cartilaginous, grumose (divided into small lobes by numerous chinks and fissures). Embryo erect, small, slightly curved, somewhat dorsal: cotyledons lanceolate.—Glabrous shrubs. Leaves opposite, petioled, attenuated at the base. Stipules usually with hair at their base on the inside, often caducous. Corymbs terminal. Flowers sessile.

Several East Indian species of *Psychotria*, as *P. Reevesii*, belong to this genus.

1329. (1) G. *subinteger* (W. & A.:) erect: leaves long-petioled, oblong-lanceolate, tapering at the base: stipules oval, caducous: corymbs long-peduncled with rarely a pair of leaves at the lowest branches, naked (or with minute bracteas): calyx-limb membranaceous, entire with 5 minute teeth: tube of the corolla very short, scarcely so long as the limb of the calyx: berry globose, not furrowed.—*Wight! cat. n.* 1346.

Sent formerly to Dr Wallich as a species of *Ixora:* we do not know under what name it is inserted in his List.

1330. (2) G. *congesta* (W. & A.:) erect: leaves short-petioled, oblong, acuminated at both ends, becoming yellowish by drying: stipules broadly triangular, cuspidate, caducous: corymbs sessile, at first compact and scarcely longer than the stipules, afterwards larger but also compact or rarely spreading when in fruit, naked: calyx-limb somewhat bluntly 5-toothed: tube of the corolla short, scarcely longer than the calyx-limb: berry ovoid, not furrowed.—*Wight! cat. n.* 1347.

The fruit is black and similar to the figure of Gærtner's *G. nigra:* perhaps it may be that species. Dr Wight sent it formerly to Dr Wallich without a name, but it does not appear to be in his List. The hair inside the stipules close to the corymb is very copious and of a bright tawny colour.

XXVI. PSYCHOTRIA. *Linn.*

Calyx-tube ovate; the limb short, 5-lobed, 5-toothed or somewhat entire. Corolla infundibuliform, usually short, 5- (or rarely 4-) cleft, regular: throat glabrous or bearded; limb spreading or recurved, segments incurved at the point: æstivation valvular. Stamens 5 or rarely 4; the anthers exserted or included within the throat of the corolla. Stigma bifid. Berry drupaceous, containing 2 nuts, crowned with the limb of the calyx, usually marked with 10 ribs by drying, sometimes 4-angled and with 4 furrows, sometimes even. Nuts chartaceously coriaceous, ribbed, angled or even, 1-seeded. Seed erect, with a cartilaginous solid (not ruminated) albumen.—Trees or shrubs, rarely herbaceous plants. Leaves opposite, petioled. Peduncles usually terminal. Flowers panicled or corymbose.

De Candolle's definition is much more limited: he requires a short corolla, a 10-ribbed fruit, ribbed nuts, and a small erect embryo at the base of the albumen; but

Digitized by Google

this character would exclude numerous species principally from East India, placed by him in the genus: thus *P. curviflora*, Wall., and *P. ophioxyloides*, Wall., have the corolla long and slender, and *P. sphærocarpa*, Wall., has the fruit without ribs. De Candolle has already remarked that in some species there are 4 stamens and 4 divisions to the flower, and that in others both that and the normal number occur in the same specimen. In *Ixora* and *Pavetta*, on the other hand, similar anomalies have been observed; so that it is probable that the long-flowered species (one of which, and the only one of which we have seen the seeds, has them convex and without furrows on the outside, and deeply concave on the inner), ought to be referred to *Ixora*; the shape of the corolla, however, is different.

1331. (1) P. *ambigua* (W. & A.:) shrubby, erect, glabrous: leaves oblong-lanceolate, tapering much at the base, lower ones long-petioled, upper shortly: stipules triangular-ovate, acuminated or cuspidate: corymbs terminal, peduncled, trichotomous, lax, somewhat fleshy, with small ovate acute sometimes toothed bracteas subtending the ramifications: limb of the calyx shortly cup-shaped, minutely 5-toothed: flower-bud clavate and curved: corolla somewhat tubular, widest at the mouth, 6–8 times longer than the calyx, slightly hairy about the insertion of the stamens: filaments short; anthers exserted, linear, mucronulate: stigma somewhat included, the divisions linear: fruit globose, with 10 small ribs, even between the ribs: albumen thin, cup-shaped.—*Wight! cat. n.* 1350.——Courtallum mountains.

The albumen is horny, with the embryo small at its base: the disk is shortly cylindrical, longer than the limb of the calyx, and obscurely 5-lobed at the apex: ovule erect: nuts open along the middle of the inner surface as in the coffee.

†1332. (2) P. *truncata* (Wall.:) shrubby, erect, glabrous: leaves long-petioled, elliptic-ovate, tapering at the base, becoming yellowish on being dried; axils with a tuft of long white hairs: stipules large, ovate, acute, deciduous, often longer than the petioles: corymb terminal, small, peduncled, about two-thirds shorter than the uppermost pair of leaves; ramifications fleshy, rather short, with a pair of small bracteas under each division: calyx truncated, obscurely 5-toothed: corolla about 4 times longer than the calyx. —*Wall. in Roxb. fl. Ind.* (*ed. Wall.*) 2. *p.* 162.

†1333. (3) P. *connata* (Wall.:) shrubby, erect, glabrous: leaves very shortly petioled, lanceolate, acuminated, tapering much at the base: stipules ovate, cuspidate, slightly recurved at the apex, twice the length of the petioles, the uppermost acuminated: corymb terminal, long-peduncled, ovate, the first ramifications umbellate, the rest trichotomous; partial peduncles with two large ovate acute obscurely lobed ciliated connate bracteas: calyx-limb urceolate, entire, obscurely 5-toothed: tube of the corolla about thrice longer than the calyx: stigma included, the divisions linear: berry ovate, angular when dried: seeds flat.—*Wall. in Roxb. fl. Ind.* (*ed. Wall.*) 2. *p.* 163.

1334. (4) P. *lævigata* (W. & A.:) shrubby, erect, glabrous: leaves very shortly petioled, oblong-lanceolate, acuminated, cuneate or tapering at the base: stipules lanceolate, acuminated, twice the length of the petioles: corymb terminal, longish-peduncled; primary rays and those on the central primary one in fives, subtended by four bracteas; the other rays in threes and subtended by two bracteas; bracteas all lanceolate-acuminated, connate at the base: flowers aggregated at the extremities of the partial rays, intermixed with broad lanceolate acuminated bracteas: calyx-limb 5-cleft, lobes ovate, slightly ciliated: tube of the corolla much bearded in the throat, scarcely longer than the segments of the calyx: filaments longish, exserted; anthers oblong: stigma short and thick, bilamellate, scarcely exserted: berry ovate, with four deep furrows: albumen flat on the inner side, with two deep dorsal furrows and a broad obtuse rib between them.—*Wight! cat. n.* 1349.—Vitex lævigata, *herb. Madr.*——Courtallum.

Ovule erect: the disk that crowns the ovary is 5-lobed. We are very doubtful if this and the next are genuine species of the genus: but the large

Digitized by Google

size of the bracteas and bracteoles are scarcely sufficient to remove them to *Cephælis*.

1335. (5) P.? *bracteata* (W. & A.:) shrubby, erect, glabrous: leaves somewhat shortly petioled, oblong-obovate, with a sudden short point, becoming yellowish on being dried, uppermost ones oval; axils with a tuft of longish hair: stipules oblong-oval, caducous: corymb terminal, long-peduncled; primary rays and lowest ones of the central primary ray in fives, subtended by four bracteas; the other rays in threes and subtended by two bracteas: bracteas all broadly obovate, obtuse or emarginate, connate at the base: flowers aggregated at the extremities of the secondary rays, surrounded by and intermixed with several large roundish bracteas: calyx-limb 5-cleft; lobes roundish, emarginate, the edges overlapping: tube of the corolla a little longer than the calyx-limb, much bearded in the throat: anthers oblong, sessile, slightly exserted: stigma scarcely exserted, short and thick, bilamellate. —*Wight! cat. n.* 1348.

Of this we have not seen the fruit.

1336. (6) P. *bisulcata* (W. & A.:) shrubby, diffuse, glabrous: leaves with a short petiole slightly dilated at the base, oblong-lanceolate, tapering at the base: stipules triangular-acuminated, caducous: corymb terminal, peduncled, small, few-flowered, trichotomous or with the primary rays in fives, with minute acute bracteas subtending the ramifications: calyx-limb 5-lobed; lobes roundish-ovate: tube of the corolla bearded in the throat, about twice the length of the calyx-limb: filaments exserted; anthers oblong: stigma nearly included, short and thick, bipartite: berry ovate, 4-furrowed by drying: seed and albumen flat on the inner side, with two deep dorsal furrows and an intermediate broad blunt ridge.—*Wight! cat. n.* 1351.

1337. (7) P.? *vaginans* (DC.:) shrubby, erect, glabrous: leaves obovate-oblong or oval, shortly pointed, attenuated at the base: stipules intrafoliaceous, at length 2-toothed, combined into a sheathing 2-cleft tube: corymb terminal, peduncled, with or without a pair of small leaves at its base, panicle-shaped, trichotomous, puberulous, with oblong acuminated toothed small bracteas subtending all the divisions: calyx-limb broadly cup-shaped, truncated and shortly 5-toothed: tube of the corolla slightly longer than the calyx-limb, hairy in the throat: anthers nearly sessile, exserted, oblong-linear: style slightly hairy; stigma thickish, short, 2-partite, segments recurved.—*DC. prod.* 4. *p.* 520; *Wight! cat. n.* 1352.—Ophioxylon arboreum, *Koen.*

We have not seen the fruit, so that it may prove to be a species of *Grumilea*. Our specimens are from Klein's herbarium, marked "Bentodi, March 16. 1796." We follow De Candolle in supposing the panicle to be peduncled; for, although it at first often appears to be sessile, on account of the two leaves at its base, yet the stipules to these leaves are of a different shape from those below.

1338. (8) P.? *nudiflora* (W. & A.:) shrubby, glabrous: young shoots compressed: stipules ovate, acute, deciduous: leaves petioled, lanceolate-oblong, shortly pointed, tapering much at the base, shining on both sides: corymbs terminal, longish-peduncled, small, ovate, without bracteas or bracteoles; primary rays in fives, short, the others trichotomous: calyx-limb short, truncated, obscurely 4-toothed: tube of the corolla somewhat campanulate, 2–3 times the length of the calyx-limb, glabrous on the inside; lobes 4: stamens 4; filaments very short; anthers oval, exserted: style glabrous, perforating the thick obscurely 4-lobed disk, exserted; divisions of the stigma thick, spreading.—*Wight! cat. n.* 1354.

We do not know that Dr Wallich has taken up this species: it was sent to him formerly as probably a species of *Ophiorrhiza*, with which it agrees in the naked inflorescence; but the ovule is solitary and erect in each cell of the ovary. Perhaps our character may require to be modified, as we have before us only one specimen, and that without fruit: those sent to the India House were much more complete.

Digitized by Google

XXVII. COFFEA. *Linn.; Gærtn. fr.* 1. *t.* 25; *Lam. ill. t.* 160.

Calyx-tube ovate, globose or turbinate; limb small, 4–5-toothed. Corolla tubular, infundibuliform; limb spreading, 4–5 partite, the lobes oblong: æstivation twisted. Stamens 4–5, inserted on the summit or middle of the tube, exserted or included. Style bifid at the apex, the lobes rarely cohering. Berry umbilicated, naked or crowned with the calyx-limb, containing two somewhat parchment-like 1-seeded nuts. Seed convex on the outer side, flat and marked with a longitudinal furrow on the inner. Embryo erect in a horny albumen; radicle terete, obtuse; cotyledons foliaceous.—Trees or shrubs. Leaves opposite. Stipules interpetiolar.

This character is adopted from De Candolle, except what we have added relative to the æstivation of the corolla: we fear it is not sufficient to distinguish the genus from several others; and moreover it is exceedingly doubtful that several species, of which the fruit is unknown, do accord with it: the anthers in all the specimens we have seen are long-linear.

* 1339. (1) C. *Arabica* (Linn.:) stipules on both sides solitary, entire: leaves oblong-ovate, acuminated, glabrous: peduncles axillary, short, aggregated: calyx-limb not increasing after flowering: corolla 5-cleft, glabrous in the throat: anthers linear, entirely exserted: style much exserted: stigma bipartite, lobes linear: berry ovate.—*DC. prod.* 4. *p.* 499; *Spr. syst.* 1. *p.* 755; *Roxb. fl. Ind.* 1. *p.* 539; (*ed. Wall.*) 2. *p.* 193; *Wall.! L. n.* 6243; *Wight! cat. n.* 1355.—*Pluk. t.* 272. *f.* 1.

1340. (2) C. *Benghalensis* (Roxb.:) shrubby and bushy: leaves oblong or ovate, obtuse-pointed, glabrous on both sides or hairy on the nerves underneath: stipules subulate: flowers somewhat sessile, usually 1–3 (sometimes more) together: limb of the calyx almost entire, not increasing after flowering: corolla 5-cleft, glabrous within, segments oval-oblong: anthers attached by the middle of their back to the tube of the corolla, linear, with the point curved and alone exserted: style about half the length of the corolla: stigma bipartite, lobes linear: berry shortly ovoid.—*Roxb. fl. Ind.* 1. *p.* 540; (*ed. Wall.*) 2. *p.* 194; *in E. I. C. mus. tab.* 1031; *Roth, nov. sp. p.* 148; *DC. prod.* 4. *p* 499; *Spr. syst.* 1. *p.* 755; *Wall. L. n.* 6244; *Wight! cat. n.* 1356.

We have great doubts if this and the two next be not varieties of one species: in Roxburgh's drawing, from cultivated specimens, some of the leaves are represented scarcely above an inch long, while in *C. Wightiana* they are occasionally as large, although usually not above half an inch in length; *C. Travancorensis* is intermediate: the three agree in all the remarkable or essential points, the long tube to the corolla, and included stamens attached by the middle of their back. Perhaps none of them belong to the present genus: in the only ripe berry (in *C. Travancorensis*) which we have seen, we could find no trace of the parchment-like nut; the seed lay loose in the interior of each cell, so that if the nut were present it must have been incorporated with the pericarp: as, however, too much injury has been already done to the science by naming or constituting species and genera from isolated or imperfect materials, we prefer leaving them for the present in *Coffea*.

1341. (3) C. *Travancorensis* (herb. Madr.:) shrubby and bushy: leaves ovate or oblong, bluntly or shortly pointed, glabrous on both sides: stipules short-roundish, with a cuspidate point: flowers 3–4, nearly sessile on very short axillary somewhat abortive leafless branchlets: limb of the calyx almost quite entire, not increasing after flowering: corolla 5-cleft, glabrous within, segments obovate or cuneate oblong: anthers attached by the middle of their back to the tube of the corolla, linear, with the point slightly curved and

Digitized by Google

alone exserted: style not half the length of the corolla; stigma bipartite, lobes linear.—*Wall.! L. n.* 6245; *Wight! cat. n.* 1357.——Travancore.

Perhaps only to be distinguished from the last by the stipules.

1342. (4) C. *Wightiana* (Wall.:) shrubby, bushy, rigidly and shortly branched, with occasionally short axillary abortive or spinescent branchlets: leaves ovate, obtuse, glabrous on both sides: stipules subulate, rigid and spinescent: flowers usually solitary, sessile, axillary or at the apex of short 2-leaved axillary branchlets: limb of the calyx with about 10 minute gland-like teeth, not increasing after flowering: corolla 5-cleft, pubescent or viscous on the outside, glabrous within; segments linear-oblong: anthers attached by the middle of their back to the tube of the corolla, linear, entirely included: style not half the length of the corolla; stigma bipartite, lobes linear: berry somewhat didymous.—*Wall.! L. n.* 6246; *Wight! cat. n.* 1358. ——Coimbatore.

XXVIII. GEOPHILA. *Don.*

Calyx-tube obovate; limb 5-partite, the segments linear, spreading or recurved. Corolla tubular, hairy in the throat, with five ovate somewhat recurved lobes. Anthers 5, included. Stigma bifid. Berry ovoid, angled with ribs, crowned with the calyx, 2-celled, 2-seeded.—Herbaceous perennial depressed creeping plants. Leaves petioled and cordate, almost like those of *Viola*. Stipules solitary on both sides, undivided. Peduncles springing from the uppermost axil, terminal, solitary, bearing several flowers at the apex. Flowers somewhat sessile, umbellate, involucred by several bracteas that are shorter than the flowers.

1343. (1) G. *reniformis* (Don:) petioles and peduncles hirsute or pubescent: leaves roundish-cordate: peduncles 2–3-flowered, shorter than the leaf. —*Don. prod. fl. Nep. p.* 136; *DC. prod.* 4. *p.* 537; *Spr. syst. suppl. p.* 82; *Cham. and Schlecht. in Linnæa*, 4. *p.* 137.—G. diversifolia, *DC.? l. c.*—Psychotria herbacea, *Linn. sp. p.* 245; *Roxb. fl. Ind.* 1. *p.* 533; (*ed. Wall.*) 2. *p.* 161.—*Rheed. Mal.* 10. *t.* 21——Malabar; *Rheede.*

Variable as to pubescence and shape of the leaves: sometimes they are quite obtuse, sometimes acute. We have specimens from Otaheite of what appears the very same plant, but almost entirely glabrous and with the peduncles 1-flowered. De Candolle enumerates six species, but putting out of view the variable parts of the character (as pubescence and form of the leaves), we can scarcely say how they are to be distinguished: most of them are taken up either from authors who appear to have described them from solitary specimens, and who therefore could not have seen the connecting forms, or who had been unacquainted with the species noticed by other botanists.

TRIBE VII. SPERMACOCEÆ. *Cham. and Schlecht.*

Stigma bilamellate or undivided. Fruit dry or scarcely fleshy, composed usually of two, rarely of three or four 1-seeded mericarps, that are sometimes concrete, sometimes separating and indehiscent, and sometimes variously dehiscent: dehiscence never loculicidal. Albumen fleshy or somewhat horny.—Shrubs or herbaceous plants. Leaves opposite. Stipules membranaceous at the base, with usually several bristles at the apex.

Digitized by Google

SUBTRIBE I. EUSPERMACOCEÆ. *DC.*

Flowers distinct: fruit dry, splitting into 2 (sometimes 3–4) portions, rarely falling off with the parts cohering together.

XXIX. BIGELOWIA. *Spr.*—Borreria, *Meyer* (not *Achar*); *DC.*

Calyx-tube ovate; limb persistent, divided into 2–4 teeth. Corolla hypocrateriform or infundibuliform, 4-lobed. Stamens 4, exserted or included. Stigma bifid or undivided. Capsule crowned with the limb of the calyx, 2-celled, when ripe splitting septicidally from the apex downwards, without any free dissepiment; the cocci 1-seeded, each dehiscing equally by a longitudinal chink along the inner surface. Seeds ovate-oblong, marked on the inner side with a longitudinal furrow.—Herbaceous or suffrutescent plants. Leaves opposite or apparently verticillate from the presence of some axillary fascicled young ones. Stipules connate with both petioles, more or less sheathing, fringed on both sides with several bristles. Flowers axillary or terminal, usually verticillate-capitate, small, white or blue.

We can scarcely insert here *Borreria ocymoides* of De Candolle, received from Mr Lambert, as he does not mention from what part of India it was obtained: if Mr Lambert obtained it from Dr Wallich, as is probable, it is likely to be one of the true species of *Spermacoce* in his List: *Sperm. ocymoides*, Burm. fl. Ind. t. 13. f. 1, a Java plant with glabrous stems and tomentose leaves, is surely very distinct.

1344. (1) B. *lasiocarpa* (W. & A.:) stem herbaceous, erect, acutely 4-angled, the angles scabrous from small recurved prickles: leaves linear-lanceolate, scabrous: bristles of the stipules longer than the sheath, glabrous and smooth, filiform and rigid: verticils of flowers globose, axillary, remote: fruit obovate-globose, glabrous and somewhat membranaceous at the base, very hispid towards the apex, crowned with the four erect calycine lobes.—*Wight! cat. n.* 1359.—Spermacoce lasiocarpa, *Brown in Wall.! L. n.* 832.—S. stricta, *Roxb. fl. Ind.* 1. *p.* 370 (not *Linn.*); (*ed. Wall.*) 1. *p.* 376; *DC. prod.* 4. *p.* 554.—S. verticillata, *Roxb. in E. I. C. mus. tab.* 537.

We scarcely know how this differs from *Sp. stricta* of Linnæus, but, although Mr Brown only says that it is *scarcely* the Linnæan plant, we presume that he would not have encumbered the science with an additional name but for the best reasons.

1345. (2) B. *Roxburghiana* (W. & A.:) stems herbaceous, 4-angled, ascending, glabrous and smooth: leaves oblong-lanceolate, acuminated at both ends, slightly scabrous: bristles of the stipules 2–3 times longer than the sheath, glabrous and smooth, filiform and rigid: verticils of flowers axillary, globose, remote: fruit somewhat hemispherical, compressed, hispid, crowned with the 4 erect subulate calycine lobes.—*Wight! cat. n.* 1360.—Spermacoce Roxburghiana, *Wall.! L. n.* 6186.—Dindygul, Travancore, and other southern provinces.

The root appears sometimes to be annual, sometimes woody or even suffruticose. As a species it only differs from the last by the smooth stems.

1346. (3) B. *Kleinii* (W. & A.:) stems 4-angled, glabrous: leaves (small) cuneate-ovate, acute, sessile, glabrous and smooth: bristles of the stipules 2–3 times longer than the sheath, glabrous and smooth, filiform and rigid: verticils of flowers axillary, globose, remote: fruit somewhat hemispherical, compressed, hispid, crowned with the 4 erect subulate calycine lobes.—Spermacoce ocymoides, *herb. Madr.* (not *Burm.*); *Wall.! L. n.* 6185.

It is with much reluctance that we characterise this species, convinced as we are that it is a mere accidental form of the preceding. *B. ramosa* (*Sp.*

Digitized by Google

ramosa, Wall.! L. n. 831) is quite intermediate, having the leaves shaped as in *B. Kleinii*, but slightly hispid as in *B. Roxburghiana*.

XXX. SPERMACOCE. *Linn; Meyer; Cham. and Schlecht.*

Calyx-tube ovate or turbinate; the limb divided into 2–4 teeth, with sometimes accessory ones. Corolla hypocrateriform or infundibuliform, 4-lobed. Stigma bifid or entire. Capsule crowned with the (sometimes obliterated) limb of the calyx, 2-celled; the cocci 1-seeded, separating from the apex downwards, the one shut by the dissepiment, the other open. Seeds oval-oblong, marked on the inner side with a longitudinal furrow.—Herbaceous or suffrutescent plants. Stems and branches usually 4-angled. Leaves opposite. Stipules cohering with both petioles, sheathing, fringed with several bristles. Flowers axillary, sessile, crowded, verticillate or half-verticillate, small, white or blue.

1347. (1) S. *articularis* (Linn.:) herbaceous, diffuse, hairy and scabrous: leaves from broad-lanceolate to obovate-oblong, usually acute but not pointed: bristles of the stipules longer than the hispid sheath: flowers 2–4 axillary, sessile, tube of the corolla slender, 4–8 times longer than the teeth of the calyx: capsule oval, pubescent hirsute or villous, crowned with 4 calycine teeth.—*Linn. f. suppl. p.* 119 (exc. syn.); *DC. prod.* 4. *p.* 555; *Spr. syst.* 1. *p.* 402; *Roxb. fl. Ind.* 1. *p.* 372; *(ed. Wall.)* 1. *p.* 378; *in E. I. C. mus. tab.* 1525; *Wall.! L. n.* 827; *Wight! cat. n.* 1361.—S. scabra, *Wall.! L. n.* 824 (partly).

This can only be recognised from the following by the slender tube of the corolla, and as both species vary considerably in its length and shape, we are even much inclined to doubt if that character ought to be trusted to. The leaves are usually flat, but in very arid soils become occasionally curled and waved. *S. longicaulis*, Br. in Wall.! L. n. 826, appears to us to be a mere form of our plant.

1348. (2) S. *hispida* (Linn.:) herbaceous, diffuse, more or less hairy or scabrous: leaves from obovate-oblong to roundish, bluntish and somewhat mucronate or slightly lanceolate and pointed, flattish or waved: bristles of the stipules longer than the hirsute sheath: flowers axillary, usually 1–4 together (sometimes more numerous), sessile: tube of the corolla rather wide, from as long to twice or thrice as long as the calyx-teeth; fruit hirsute or villous, oval, crowned with the 4 calycine-teeth.—*Linn. mant. p.* 558; *DC. prod.* 4. *p.* 555; *Spr. syst.* 1. *p.* 400; *Roxb. fl. Ind.* 1. *p.* 373; (*ed. Wall.*) 2. *p.* 379; *in E. I. C. mus. tab.* 1526; *Wall.! L. n.* 825; *Wight! cat. n.* 1362.—Sp. hirta, *Rottl. in nov. act. n. cur. Berol.* 1803. *p.* 95.—S. scabra, *Willd. sp.* 1. *p.* 572; *DC. l. c.*; *Spr. l. c. p.* 401; *Roxb. fl. Ind.* 1. *p.* 371; (*ed. Wall.*) 1. *p.* 377; *in E. I. C. mus. tab.* 1524; *Wall.! L. n.* 824 (partly).—*Rheed. Mal.* 9. *t.* 76; *Burm. Zeyl. t.* 20. *f.* 3.

A common plant in the Peninsula, and by no means confined to the sandy lands near the sea shore, the locality mentioned by Roxburgh. It is found, also, throughout many other parts of India; we have specimens before us from Canton-China. In moist places the leaves are usually less harsh, much larger (sometimes 2 inches long and 1 inch broad) and scarcely waved, the extreme state of which represents the Linnæan plant: in dry sandy soils the leaves are very harsh and rigid, smaller and rounder (often scarcely half an inch each way), much waved and curled, and this represents *S. hirta* of Rottler or *S. scabra* of Willdenow. But so numerous are the gradations that we have found it quite impossible to separate the specimens before us into varieties. *S. scabra*, Wall.! L. n. 824. *a*, is the most distinct of all, having the leaves narrow and slightly pointed; in this respect it approaches to *S. ramo-*

Digitized by Google

sissima, Br. in Wall.! L. n. 829, if indeed that species be not likewise referable to *S. hispida*.

†1349. (3) S. *tenera* (Brown.)—*Wall. L. n.* 833.—S. ocymoides, *herb. Heyne* (not *Burm.*).

Is perhaps a species of *Bigelowia*.

†1350. (4) S. *tubularis* (Brown.)—*Wall. L. n.* 833.—S. hirta, *herb. Heyne* (not *Linn.*).

As we understand that it was Rottler who usually named Heyne's plants for him, we should have expected this species to have been the same which we have referred above to *S. hispida*: we presume, however, that Mr Brown has ascertained the contrary.

XXXI. KNOXIA. *Linn.; Gærtn. fr. t.* 25; *Lam. ill. t.* 59.

Calyx-tube ovate, somewhat ribbed: limb of 4 unequal minute teeth that are persistent and somewhat connivent when in fruit. Corolla hypocrateriform or ifffundibuliform; tube terete, usually bearded in the throat; limb 4-lobed: æstivation valvular. Stamens 4, inserted upon the throat: filaments shortish or wanting: anthers oblong. Stigma 2-lobed. Fruit 2-celled, composed of two indehiscent 1-seeded cocci: cocci either separating from each other from the base upwards, or falling off cohering together; the axis persistent and filiform (as the *Umbelliferæ*). Seeds ovate-triquetrous, erect. Albumen fleshy. Embryo erect.—Herbaceous or suffrutescent plants. Stems terete or 4-angled, erect. Leaves opposite, or apparently verticillated on account of the fascicled axillary young ones. Stipules undivided or with several bristles connecting the bases of the petioles. Cymes terminal, sessile or peduncled, the branches elongating in fruit and becoming spike-shaped.

1351. (1) K. *corymbosa* (Willd.:) stem somewhat shrubby, erect, shortly villous or more or less hirsute, terete or obtusely 4-angled; young shoots terete: leaves lanceolate, hispid on the upper side; under pubescent, principally so on the nerves: stipules with several long erect bristles: cymes corymbose, often very compound; branches erect, at length spike-shaped: corolla infundibuliform; tube slender, very villous on the inside: anthers included with the style exserted, or the filaments exserted with the style included: fruit oval, falling off entire.—*Willd. sp.* 1. *p.* 582; *Spr. syst.* 1. *p.* 406; *Wight! cat. n.* 1363.—K. teres, *DC. prod.* 4. *p.* 569; *Wall.! L. n.* 819.—K. umbellata, *herb. Banks; Spr. l. c.*—K. exserta, *DC. l. c.*—K. Sumatrensis, *Wall.! L. n.* 6183.—Spermacoce teres, *Roxb. fl. Ind.* 1. *p.* 367; (*ed. Wall.*) 1. *p.* 373; *in E. I. C. mus. tab.* 1335.—S. exserta, *Roxb. fl. Ind.* 1. *p.* 368; (*ed Wall.*) 1. *p.* 374—S. Sumatrensis, *Retz, obs.* 4. *p.* 23 (according to *Cham. and Schlecht. in Linnæa*, 3. *p.* 366).—*Pluk. t.* 482. *f.* 2.——Circars. Dindygul. Colamala. Courtallum.

The same inverted proportion of stamens and style takes place in this plant, and also in *K. Heyneana* and *K. Wightiana*, which we have already noticed in several species of *Hedyotis*. We fear there are no good grounds for separating Dr Wallich's *K. Sumatrensis*: Dr Wight's specimens of it, which he sent to Dr Wallich (Wall. L. n. 6183. *b*) were obtained from the Madras herbarium under the name of *S. corymbosa*, Willd. (so named by Willdenow himself), and are therefore identical with *K. teres*, Wall. L. n. 819. *d*.

1352. (2) K. *mollis* (Brown:) stem shrubby, erect, obsoletely 4-sided, villous; branches 4-sided, villous: leaves lanceolate, pubescent: stipules with several bristles or subulate divisions: cymes corymbose, compound, ramifications umbellate: corolla with a short tube: anthers included: fruit oblong, splitting from the base upwards.—*Brown in Wall.! L. n.* 820.—K. Su-

Digitized by Google

matrensis, *DC. prod.* 4. *p.* 569.—K. umbellifera, *Roxb. in E. I. C. mus. tab.* 536.——Circars.

Roxburgh refers here *K. stricta*, Gærtn. fr. 1. p. 122. t. 25, which is confirmed by De Candolle, who had seen a specimen so named by Vahl, probably also received from Koenig, and therefore correctly labelled: but the name is so much less appropriate when applied to this species than to *K. Zeylanica*, that we are rather disposed to remove that synonym there: and in confirmation, it is not likely that Mr Brown would have given a new specific name to the present plant if it were really the same as Koenig's in the Banksian herbarium. De Candolle says that the specimen which he examined had an annual root; so has our own from Dr Wallich, but the specimen is only of one year's growth, and we have no doubt but in favourable circumstances, and in the wild state, the stem is shrubby. In Roxburgh's drawing the corymbs resemble a very compound umbel, and the corolla is shortly hypocrateriform with the tube gibbous; in our specimen the corymbs are much the same as in *K. corymbosa*, and the corolla, although short, is decidedly infundibuliform: these variations, however, appear to be of no consequence.

1353. (3) K. *Heyneana* (DC.:) stem somewhat shrubby, obsoletely 4-angled or terete, from slightly rough to quite glabrous and smooth: leaves lanceolate, marked with the line-like nerves on the under side, very slightly rough from minute points or sometimes quite smooth: stipules with several longish bristles: cymes trichotomous, the branches in fruit elongated: corolla long-infundibuliform; tube slender at the base, much dilated at the mouth: anthers included or exserted: fruit oval, splitting from the base upwards.—*DC. prod.* 4. *p.* 570; *Wight! cat. n.* 1364.—Spermacoce corymbosa, *Roth, nov. sp. p.* 98; *Spr. syst.* 1. *p.* 404.

The specimens before us appear to have been gathered by Heyne, but we do not know the precise locality.

1354. (4) K. *Wightiana* (Wall.:) shrubby, and quite glabrous all over: stems 4-sided; branches terete, long and twiggy: leaves lanceolate, upper ones narrower and linear, bluntish, somewhat coriaceous: stipules lanceolate, entire or with a subulate process on each side: cymes peduncled, trichotomous; branches elongating in fruit: corolla infundibuliform; tube shortish: anthers exserted or included: fruit compressed-orbicular, splitting from the base upwards.—*Wall.! L. n.* 6184; *Wight! cat. n.* 1365.——Courtallum.

1355. (5) K. *Zeylanica* (Linn.:) stem erect, glabrous, somewhat terete: leaves lanceolate, glabrous: stipules with several longish bristles: cyme composed of 1–3 very long simple erect spike-like branches: corolla infundibuliform; tube long, slender at the base, bearded in the throat: fruit ovate, splitting from the base upwards.—*Linn. sp. p.* 151; *DC. prod.* 4. *p.* 569; *Spr. syst.* 1. *p.* 406; *Burm. fl. Ind p.* 34. *t.* 13. *f.* 2; *Lam. ill. t.* 59. *f.* 1; *Wight! cat. n.* 1366.—K. stricta, *Gærtn.? fr.* 1. *p.* 122. *t.* 25.

Our specimen is from Rottler's herbarium: we do not know the locality.

SUBTRIBE II.—PUTORIEÆ. *DC.*

Fruit more or less fleshy, entire.

XXXII. SERISSA. *Comm.; Lam. ill. t.* 151. *f.* 3.—Dysoda. *Lour.*—Buchozia. *L'Her.*

Calyx-tube obovate; limb 5- (or occasionally 4-) cleft, lobes short, with sometimes accessory intermediate teeth. Corolla infundibuliform: tube hairy on the inside: limb 5- (or occasionally 4-) lobed; lobes induplicate during æstivation. Stamens 5–4: anthers linear, exserted. Style included.

Digitized by Google

Stigma bifid. Berry somewhat globose, 2-celled, 2-seeded, crowned with the limb of the calyx.—Shrubby, almost entirely glabrous with the exception of the young shoots: branches whitish. Leaves somewhat sessile, opposite, and often fascicled in the axils, giving out a disagreeable smell when bruised. Stipules connate with the petioles, with a few rigid spinescent bristles. Flowers somewhat fascicled, terminal, white.

* 1356. (1) S. *fœtida* (Comm.)—*Comm. in Juss. gen. p.* 209; *DC. prod.* 4. *p.* 575; *Spr. syst.* 1. *p.* 756; *Roxb. fl. Ind.* 1. *p.* 579; (*ed. Wall.*) 2. *p.* 268; *Wall.! L. n.* 6226; *Wight! cat. n.* 1368.—Dysoda fasciculata, *Lour. Coch.* (*ed Willd.*) 1. *p.* 181 (descr. of fruit bad).—D. fœtida, *Salisb.*—Lycium Japonicum, *Thunb. Jap. t.* 17.—L. fœtidum, *Linn. suppl. p.* 150.—L. Indicum, *Retz, obs.* 2. *p.* 12.—Buchozia coprosmoides, *L'Her.*

We have specimens before us from China, the Madras herbarium, Mauritius (Sieb. fl. mixta, No. 210), and the island of St Vincent's, but we suspect it to be cultivated everywhere except in China or Japan: Roxburgh, indeed, says expressly that it was introduced into the gardens in India from China.

XXXIII. HYDROPHYLAX. *Linn. f.; Lam. ill. t.* 76. *f.* 1.—Sarissus, *Gærtn. fr.* 1. *t.* 25.

Calyx-tube ovate, angled: limb 4-partite, persistent; segments acute, erect. Corolla somewhat fleshy, widely infundibuliform, tubular and cylindrical below, then much widened and campanulate, with a dense ring of moniliform hairs on the inside at the base of the campanulate portion, 4-lobed. Stamens 4: filaments exserted, decurrent from between the lobes of the corolla to the ring of hairs: anthers oblong. Ovary crowned with a fleshy disk. Style perforating the disk, filiform, the length of the tube of the corolla. Stigma obtuse, divided by a slight furrow with 2 lobes. Fruit oblong, fleshy, when dry somewhat corky, compressed, acutely 4-angled, with smaller intermediate ribs or angles on the sides, crowned with the calycine segments, 2-celled. Seeds solitary in each cell (one of them usually abortive), oblong. Albumen hard: embryo erect.—Herbaceous, glabrous, with long creeping terete stems, throwing up terete leafy branches. Leaves opposite, obovate-oblong, sharp, fleshy. Stipules combined with the petioles into short truncated entire or toothed cup-shaped sheathes. Flowers axillary, sessile, solitary or in pairs, pinkish.

1357. (1) H. *maritima* (Linn.)—*Linn. f. suppl. p.* 126; *DC. prod.* 4. *p.* 576; *Spr. syst.* 1. *p.* 410; *Roxb. Cor.* 3. *t.* 233; *fl. Ind.* 1. *p.* 373; (*ed. Wall.*) 1. *p.* 380; *Wall.! L. n.* 6205; *Wight! cat. n.* 1369.—Sarissus anceps, *Gærtn. fr.* 1. *p.* 118. *t.* 25.——Sand-hills along the sea coast of Coromandel and Malabar.

TRIBE VIII.—STELLATÆ. *Ray; Cham. and Schlecht.*

Flowers bisexual or rather unisexual. Corolla rotate or infundibuliform: lobes valvate in æstivation. Styles 2, either distinct almost from the base, or more or less concrete. Stigmas capitate. Fruit composed of 2 indehiscent 1-seeded mericarps. Seed-coat scarcely distinguishable from the pericarp and calyx-tube. Albumen horny.—Shrubs or usually herbaceous plants. Leaves opposite, bearing buds in their axils,

Digitized by Google

forming a verticil with the 1–3 leaf-shaped stipules on each side, (commonly also called leaves, but without axillary buds).

XXXIV. RUBIA. *Tourn.; Linn.; Lam. ill. t.* 60; *Gærtn. fr.* 3. *t.* 195.

Calyx-tube ovate-globose; limb scacely any. Corolla 4–5-partite, rotate. Stamens 4–5, short. Styles 2, short. Fruit baccate, didymous, somewhat globose, fleshy and juicy.—Herbaceous or suffrutescent plants. Stems diffuse, much branched, 4-angled. Leaves 2, opposite, with 2 or rarely 3–4 intermediate stipules similar to the leaves, forming a 4–8-leaved verticil. Flowers small, greenish or yellowish white. Berries black, red, or white.

1358. (1) R. *cordifolia* (Linn.:) herbaceous: stem rough with prickles on the angles, rarely smooth: leaves in fours, long-petioled, oblong or ovate, acute or acuminated, more or less cordate, or the upper ones only rounded at the base, 3–7-nerved; the margins, middle nerve, and triquetrous petioles rough with minute prickles: panicles in the upper axils, peduncled, trichotomous, roundish: bracteas small, opposite, not forming an involucre: flowers usually 5- (sometimes 4-) cleft.—*Linn. mant. p.* 197; *DC. prod.* 4. *p.* 588; *Spr. syst.* 1. *p.* 397; *Wall.! L. n.* 6209; *Wight! cat. n.* 1370.—R. Munjista, *Roxb. fl. Ind.* 1. *p.* 374; (*ed. Wall.*) 1. *p.* 383; *in E. I. C. mus. tab.; DC. l. c.*—R. Munjith, *Desv. journ. bot.* 1814, 2. *p.* 207.—R. Javana, *DC.? l. c.*—R. secunda, *Moon, cat. Ceyl. pl. p.* 10.——Dindygul. Neelgherries.

Found throughout most of the mountainous parts of Middle and Eastern Asia, from the Equator to Lat. 51° N., exhibiting very little variation in its general aspect. Some of our specimens have the leaves glabrous, although at the same time scabrous, on both sides except on the nerves: others have the under side very pubescent between the nerves, but these are extreme states: in a specimen from Ceylon, the stem appears to be almost quite destitute of prickles. The berries are, we believe, usually red, although sometimes black.

XXXV. GALIUM. *Linn.; Lam. ill. t.* 60; *Gærtn. fr.* 1. *t.* 24.

Calyx-tube ovate-globose or oblong, with scarcely any limb. Corolla 4- (very rarely 3-) partite, rotate. Stamens short. Styles 2, short. Fruit didymous, roundish, rarely oblong, dry, composed of 2 indehiscent 1-seeded mericarps.—Herbaceous branched plants. Leaves with the stipules forming a verticil.

1359. (1) G. *asperifolium* (Wall.:) perennial: stem much branched, 4-sided; branches flaccid, 4-sided; young ones with copious soft recurved hair, older ones more glabrous: leaves in sixes, linear-oblong, somewhat cuneate at the base, with a sharp mucronate or bristle-shaped point, reflexed; upper side scabrous, recurved margins and midrib underneath with rigid recurved hairs: peduncles axillary, divaricately branched, many-flowered, arranged in a somewhat leafy panicle: divisions of the corolla lanceolate with a hair-like point: fruit glabrous, minutely granulated.—*Wall. in Roxb. fl. Ind.* (*ed. Wall.*) 1. *p.* 381; *DC. prod.* 4. *p.* 598; *Spr. syst.* 1. *p.* 388; *Wight! cat. n.* 1371.—G. aparine, *Wall.! L. n.* 6213, *a* (partly).—G. parviflorum, *Don, prod. fl. Nep. p.* 133.——Dindygul hills.

It will be observed, from comparing the character we have drawn up with that given by Wallich and De Candolle, that there is scarcely any difference between them: Wallich indeed says that the flowers are large, while in our plant they are small, according with the name given by Mr Don. None of these botanists take notice of the minutely granulated fruit; it is however

Digitized by Google

readily seen with a microscope in our specimens, although far from maturity. This species is not to be found in Wallich's List; but what was sent to Mr Arnott as n. 6213, *a*, from Nepaul, appears to be quite the same as the Peninsular plant. The flowers are white, but by drying become either yellowish or black according to the care taken in preparing the specimens.

1360. (2) G. *Requienianum* (W. & A.:) perennial: stems diffuse, ascending, branched, and the branches 4-angled, clothed with much soft spreading or deflexed hair, when old more glabrous: leaves in fours, roundish-obovate, mucronate, 3-nerved; upper side sprinkled with hairs; under more copiously hairy, particularly on the nerves and margin: peduncles axillary or terminal, few-flowered, trichotomous, hairy: divisions of the corolla roundish-ovate, slightly hairy on the outside: fruit roundish, hispid with hooked bristles.—*Wight! cat. n.* 1372.——Dindygul hills.

Very closely allied to *G. elegans*, Wall. (with which *G. latifolium*, Don, appears to be quite the same), but that species has the under surface of the leaves, except on the nerves, less hairy than the upper, the panicles divaricated many-flowered and scarcely hairy, and the divisions of the corolla lanceolate and acute.

†1361. (3) G. *Indicum* (Heyne).—*Wall. L. n.* 6214.

ORDER LXXXII.—VALERIANEÆ. *Juss.*

Calyx with a limb of various kinds, either membranous or resembling a pappus. Corolla inserted into the top of the ovarium, tubular, usually 5-lobed, rarely 3–4-lobed, lobes obtuse; tube equal, or gibbous, or spurred, at the base. Stamens 1–5, inserted into the tube of the corolla, and alternate with its lobes: anthers ovate, 2-celled. Ovarium cohering with the tube of the calyx (inferior), 1–3-celled: ovule solitary, pendulous: style filiform: stigmas 1–3, distinct or combined. Fruit dry, indehiscent, crowned with the limb of the calyx, 1-celled, or 3-celled (2 cells being then abortive). Seed solitary, pendulous. Albumen none. Embryo straight: radicle superior: cotyledons flat. —Leaves opposite, exstipulate.

I. VALERIANA. *Linn.; Neck.; DC.*

Calyx-limb involute during flowering, afterwards unrolling and forming a deciduous pappus of many plumose bristles. Corolla with the tube obconical or cylindrical, equal or gibbous, but without a spur at the base: limb obtusely 5- (rarely 3-) cleft. Stamens 3. Fruit indehiscent, when ripe 1-celled, 1-seeded.—Herbaceous or suffrutescent plants. Leaves various, often differently shaped in the same specimen. Flowers corymbose, capitate, or panicled, usually white, more rarely bluish, rose-coloured, or yellow.

1362. (1) V. *Brunoniana* (W. & A.:) herbaceous, glabrous or very slightly puberulous: stems erect with 1–2 pair of leaves near the root, and another small pair about the middle, slightly hirsute on the knots: leaves somewhat fleshy; lower ones quite entire, ovate, bluntly acuminated, long-petioled, the radical ones often emarginate at the base; uppermost or small pair somewhat sessile, narrow-oblong, entire or toothed along the margin: corymb terminal, trichotomous, panicled, with a pair of foliaceous bracteas similar to the upper-

Digitized by Google

most leaves subtending the principal branches: corolla 5-cleft: fruit linear-oblong, glabrous.—*Wight! cat. n.* 1373.

1363. (2) V. *Leschenaultii* (DC.:) herbaceous: stem erect, simple, with the knots hairy, otherwise glabrous: radical leaves petioled, ovate, obtuse, crenated, hirsute on both sides; stalk-leaves remote, small, sessile, the uppermost cut in a pinnated manner into 3–5 linear glabrous lobes, the odd one the longest: corymb contracted: fruit villous.—*DC. prod.* 4. *p.* 640; *Wall.*? *L. n.* 6636.

We have not seen this plant. We have quoted Wallich's List with doubt, because he mentions that his specimens were received from Dr Wight, while the only species with simple leaves at present in Dr Wight's collection is *V. Brunoniana*. De Candolle says that the root-leaves with their petiole are scarcely 2 inches long (in *V. Brunoniana* they are often nearly 6 inches), and the habit is that of *V. dioica*.

1364. (3) V. *Hookeriana* (W. & A.:) herbaceous: stem erect, simple, with the knots slightly hirsute, otherwise glabrous: radical leaves on very long petioles, pinnated with 5–7 leaflets; lower leaflets oblong, small, odd one ovate or cordate-ovate and repand toothed, all hirsute along the margins; cauline leaves few and distant, the lower ones resembling the radical but much smaller and with the odd leaflet oblong, uppermost pair sessile narrow-oblong and toothed: corymb panicle-shaped, lax: corolla 5-cleft: fruit lanceolate, shortly villous.—*Wight! cat. n.* 1374.

ORDER LXXXIII.—DIPSACEÆ. *Juss.*

Calyx with a limb short or elongated, entire, or toothed, or pappose. Corolla inserted on the apex of the tube of the calyx, tubular; limb oblique, 4–5-lobed, rarely ringent: æstivation imbricated. Stamens 4, inserted on the tube of the corolla, alternate with its lobes, almost always distinct: anthers 2-celled. Ovarium cohering with the tube of the calyx, either closely, or only by the apex, or at first free and afterwards cohering, 1-celled: ovule solitary, pendulous: style filiform: stigma simple. Fruit dry, indehiscent, crowned by the limb of the calyx, usually covered by an outer calyx or involucellum, 1-celled. Seed solitary, pendulous. Embryo straight, in the axis of a fleshy albumen: radicle superior.—Leaves opposite, very rarely verticillate, variable in shape on the same plant. Flowers densely capitate, or very rarely verticillate.

I. DIPSACUS. *Tourn.; Linn.; Gærtn. fr. t.* 86; *Lam. ill. t.* 56.

Flowers aggregated upon a common receptacle, separated from each other by paleæ, and each furnished with a partial calyx-shaped involucel. Heads surrounded by a general many-flowered involucre, which is usually much longer than the paleæ. Paleæ acuminated, somewhat foliaceous. Involucel 8-furrowed. Calyx-limb somewhat cup-shaped or discoid. Corolla 4-cleft, not ringent. Stamens 4, free, and nearly equal. Stigma longitudinal. Fruit crowned with the somewhat 4-angled limb of the calyx, included within the involucel.—Herbaceous biennial or rarely perennial, erect, hairy or slightly prickly plants. Leaves opposite, often connate at the base, toothed, pinnati-

Digitized by Google

fid. Heads terminal, oblong-ovate, or roundish. Corolla lilac-coloured, yellow or whitish.

1365. (1) D. *Leschenaultii* (Coult.:) stem even, slighty hairy, without prickles: leaves lyrately pinnatifid, acuminated, deeply serrated at the apex, villous or hairy on both sides; lower ones petioled; the lobes 3-nerved at the base: leaflets of the involucre patulous, shorter than the globose head, scarcely longer than the hairy oblong acuminated palese: involucel slightly produced beyond the furrows into a membranaceous crown.—*Coulter in DC.! prod. 4. p. 647; Wight! cat. n. 1375.*—Scabiosa Brunoniana, *Wall.! L. n. 429.* ——Neelgherries. Dindygul.

So very closely allied to *Cephalaria alpina*, that we can scarcely bring ourselves to consent to their being referred to different genera: in *Cephalaria*, however, the involucre is not foliaceous as in our plant.

Digitized by Google

In consequence of having received additional specimens from India during the printing of this volume, and of having obtained the unlimited use of Dr Hooker's valuable copy of the drawings presented by Dr Roxburgh to the East India Company's Museum, we are enabled to make the following

ADDITIONS AND CORRECTIONS.

No. 1. *add,* C. Gouriana, *Roxb. in E. I. C. mus. tab.* 1453.

— 17. *add,* D. Indica, *Roxb. in E. I. C. mus. tab.* 101.

— 20. *add,* M. champaca, *Roxb. in E. I. C. mus. tab.* 1071.

— 25. *add,* Uv. odorata, *Roxb. in E. I. C. mus. tab.* 1986.

— 32. *add,* Unona moniliformis, *Roxb. in E. I. C. mus. tab.* 956.

— 33. *add,* Unona odoratissima, *Roxb. in E. I. C. mus. tab.* 955.

— 35. *add,* Unona altissima, *Roxb. in E. I. C. mus. tab.* 954.

— 41. When the character was printed we had only seen the leaves and fruit: since, however, we have discovered a misplaced specimen of the male inflorescence (Wight! cat. n. 522), and received others in the same state in a good condition from the Peninsula, which enable us to determine that *Cocculus suberosus,* the type of De Candolle's genus *Cocculus,* does not agree with his character, but is the *Anamirta* of Colebrooke; and although the "Cocculus Indicus" of commerce must thus be excluded from the genus as at present defined, it may be inserted at the beginning of the order with the following character:—

ANAMIRTA. *Colebr.*

Flowers dicœcious. Calyx of 6 sepals in a double series with 2 close-pressed bracteoles. Corolla none. Male. Stamens united into a central column dilated at the apex: anthers numerous, covering the whole globose apex of the column. Fem. Flowers unknown. Drupes 1–3, 1-celled, 1-seeded. Seed globose, deeply excavated at the hilum. Albumen fleshy: cotyledons very thin, diverging.—Twining, with a corky bark. Leaves more or less cordate-ovate. Flowers in lateral compound racemes.

41. (1) A. *Cocculus* (W. & A.)—A. paniculata, *Colebr. in Linn. soc. trans.* 13. *p.* 52. *and* 66; *Wight! cat. n.* 522.—Menispermum Cocculus, *Linn.*—M. heteroclitum, *Roxb. hort. Bengh. p.* 105.—M. monadelphum, *Roxb. in E. I. C. mus. tab.* 130.—Cocculus suberosus, *W. & A. p.* 11.——Mountainous parts of the Peninsula.

Most of the synonyms we have adduced, at p. 12, still appear to us to belong to it, although it must be confessed that the old figures in Rheede, and particularly in Rumphius, give no idea of the plant. Rheede (Mal. 7. t. 1.) represents in some flowers the stamens long and distinct, in others the anthers sessile, and he describes the flowers "apicibus flavis adspersi."

— 46. *add,* Men. hirsutum, *Roxb. in E. I. C. mus. tab.* 129.

— 54. *add,* Tamara rubra, *Roxb. in E. I. C. mus. tab.* 663.—T. alba, *Roxb. l. c. tab.* 664.—*Rheed. Mal.* 11. *t.* 30: *Rumph. Amb.* 6. *t.* 73.

— 55. *add,* N. Cachlara, *Roxb. in E. I. C. mus. tab.* 659.

Digitized by Google

No. 56. *add*, N. rubra, *Roxb. in E. I. C. mus. tab.* 657.

— 57. *add*, N. Lotus, *Roxb. in E. I. C. mus. tab.* 658.

— 57. *bis* (4) N. *edulis* (DC.:) leaves oval, quite entire, downy underneath; margin sometimes very slightly waved; lobes at the base diverging: petiole attached a little within the margin: flowers white: connectivum not prolonged: stigma 10–15-rayed.—*DC. prod.* 1. *p.* 115; *Spr. syst.* 2. *p.* 605.—N. esculenta, *Roxb. fl. Ind.* 2. *p.* 578; *in E. I. C. mus. tab.* 660.—Castalia edulis, *Salisb. in Ann. Bot.* 2. *p.* 73.——Circars; *Roxburgh.*
Flowers nearly 3 inches in diameter.

— † 65. *bis* (2) Sinapis *erysimoides* (Roxb.)—*Roxb. fl. Ind.* 3. *p.* 123.
Perhaps a variety of *S. nigra.*

— † 65. *ter* (3) S. *pusilla* (Roxb.)—*Roxb. fl. Ind.* 3. *p.* 125.
The siliquæ are described as filiform, the seeds compressed, and the stigma sessile, whence we presume it cannot belong to the present genus. We have not seen it.

— 67. *add*, Cleome pentaphylla, *Roxb. in E. I. C. mus. tab.* 608.—*Rheed. Mal.* 9. *t.* 24.

— 68. *add*, C. monophylla, *Roxb. in E. I. C. mus. tab.* 1988.

— 70. *add*, C. diffusa, *Roxb. in E. I. C. mus. tab.* 340.

— 72. *add*, Cleome Chelidonii, *Roxb. in E. I. C. mus. tab.* 339.

— 73. *add*, Cleome icosandra, *Roxb. in E. I. C. mus. tab.* 669.

— 76. *add*, Capparis trifolia, *Roxb. in E. I. C. mus. tab.* 157.

— 79. *add*, Capparis heterogenea, *Roxb. in E. I. C. mus. tab.* 160.

— 80. *add*, Cleome fruticosa, *Roxb. in E. I. C. mus. tab.* 667.

— 81. *add*, Strœmia trifoliata, *Roxb. in E. I. C. mus. tab.* 1798.

— 88. *add*, C. zeylanica, *Roxb. in E. I. C. mus. tab.* 161.

— 92. *add*, C. sepiaria, *Roxb. in E. I. C. mus. tab.* 159.—*Pluk. t.* 338. *fol.* 2 7. *pl.* 3.

— 111. *add*, Chilmoria pentandra, *Ham.! in Linn. soc. tr.* 13. *p.* 501.—*Rheed. Mal.* 1. *t.* 36.

— 116. *add*, Viola suffruticosa, *Roxb. in E. I. C. mus. tab.* 1807.

— 141. *add*, T. Indica, *Roxb. in E. I. C. mus. tab.* 595.

— 142. *add*, T. dioica, *Roxb. in E. I. C. mus. tab.* 1390.

— 146. *add*, Sagina ammannoides, *Roxb. in E. I. C. mus. tab.* 552.

— 148. *add*, Saponaria perfoliata, *Roxb. in E. I. C. mus. tab.* 1242.

— 165. *add*, U. lobata, *Roxb. in E. I. C. mus. tab.* 1154.

— 170. *add*, Hibiscus Zeylanicus, *Roxb. in E. I. C. mus. tab.* 352.

— 173. *add*, H. Surattensis, *Roxb. in E. I. C. mus. tab.* 1504.
The stems are described by Roxburgh, in the fl. Ind., as woody.

— 174. *add*, We cannot see that *H. aculeatus*, Roxb. fl. Ind. 3. p. 206 (*H. Surattensis*, Roxb. in E. I. C. mus. tab. 356), at all differs from this species, although the stems are said to be annual and flexuose, while *H. furcatus* is described as erect and shrubby; different soils and modes of cultivation may readily produce these variations: our own specimens do not exhibit the stem, so that we adopted that part of our character from Roxburgh's MSS: if, however, Roxburgh's two species be really distinct, perhaps our one ought rather to be joined to his *H. aculeatus*. Probably Rheed. Mal. 6. t. 44 belongs to this species instead of to *H. Surattensis.*

Digitized by Google

No. 176. *add, H. tetralocularis,* Roxb. fl. Ind. 3. p. 198, appears to be a mere accidental variety of this species.

— 183. *add,* H. vitifolius, *Roxb. in E. I. C. mus. tab.* 1078.

— 192. *add,* Hibiscus longifolius, *Roxb. fl. Ind.* 3. *p.* 210.—H. esculentus, *Roxb. in E. I. C. mus. tab.* 1156.
Roxburgh considers the West Indian species to differ "very conspicuously both in the shape of the leaves and capsules."

— 194. *add,* Hibiscus hirtus, *Ham.; Roxb. fl. Ind.* 3. *p.* 203 (excl. syn.)—H. moschatus, *Roxb. in E. I. C. mus. tab.* 1503.

— 196. *add,* Hibiscus prostratus, *Roxb. fl. Ind.* 3. *p.* 208.

— 200. *add,* G. fuscum, *Roxb. in E. I. C. mus. tab.* 1496.

— 201. *add,* Hibiscus Solandra, *Roxb. fl. Ind.* 3. *p.* 197; *in E. I. C. mus. tab.* 1501.—H. Solandra? *Roxb. in E. I. C. mus. tab.* 350.—H. pumilus, *Roxb. fl. Ind.* 3. *p.* 203.

— 210. *add,* S. lanceolata, *Roxb. in E. I. C. mus. tab.* 346.

— 224. *add,* H. Isora, *Roxb. in E. I. C. mus. tab.* 1436.

— 255. *P. aceroides,* Wall.! L. n. 1171, according to a specimen in Dr Hooker's herbarium, is probably this species.

— 261. *add,* H. obovata, *Ham. in Linn. soc. tr.* 14. *p.* 205: *and for* Rheed. Mal. 2. t. 29, *read* Rheed. Mal. 2. t. 19.

— 321. *add,* A. racemosa, *Wight in Hook. Journ. of Bot.* 1. *p.* 64. *t.* 122.

— 323. *add,* Limonia trifoliata, *Roxb. in E. I. C. mus. tab.* 144.

— 334. *add to the obs. under the generic char.:*
Limonia minuta, Forst., belongs also to *Micromelum:* Dr Hooker possesses apparently the very same species from Java.

— 334. *add, Rheed. Mal.* 4. *t.* 53.

— 338. *add,* Limonia? pubescens, *Wall.! L. n.* 6365.

— 356. *add,* X. ovalifolius, *Wall.! L. n.* 4338 (partly).

— 360. *C. longifolium* is apparently a species of *Xanthochymus.* Leaves oblong-oval, obtuse, coriaceous, so delicately reticulated by the drying and shrinking of the parenchyma as to resemble the finest lace, not as in *Calophyllum* with the veins running in straight lines from the midrib to the margin. Flower-buds globular: pistil bottle-shaped: ovary globose: style short, conical; stigma lobed.

— 361. H. Indica; *add,* n. 439 *Linn.! in herb. Herm.* and *fl. Zeyl.*

— 368. *S. fruticosa.* From a slight examination of the specimens belonging to the Linnean Society, which however are too imperfect both in flower and fruit to enable us to determine the genus satisfactorily, it appears certainly to belong to the *Celastrineæ.*—Leaves coriaceous, elliptic-oblong, acuminated, quite entire, glabrous, upper side shining, under reticulated. Panicles axillary, dichotomous, much shorter than the leaves, few-flowered. Ovary (after the petals have fallen off) free, resembling those of *Elæodendron glaucum* at the same age.

Page 116, line 12, *for* Stamens usually as many, *read* Stamens usually twice as many.

No. 392. *add, Pluk. t.* 303. *f.* 3.

— 424. *add,* Modecca diversifolia, *Wall.! L. n.* 6763.

— 432. *Under* V. tomentosa, *α; for* Wall.! L. n. 6004. *a, b, read* Wall.! L. n. 6004, *a, c: and under β, for* Wall.! L. n. 6004. *c, read* Wall.! L. n. 6004. *b.*

Digitized by Google

No. 437. α (2) *add*, Gastonia Nalugu, *Lam.; Spr. syst.* 2. *p.* 440.—Gilibertia Nalugu, *DC. prod.* 4. *p.* 256.

Page 140, line 5 from bottom, for *oppositifolia*, read *filiformis*.

No. 463. *add*, Tytonia natans, *G. Don in Mill. dict.* 1. *p.* 749.

— 491. *add*, Sambucus Canadensis, *Burm. Ind. p.* 75.

— 545. *for* Anoma Moringa, *Lour.*, *read* Anoma Morunga, *Lour.*

— 563. *add*, *Wight! cat. n.* 989.

— 600. Crot. medicaginea; *for* peduncles bearing 2 small flowers towards the apex; *read*, peduncles bearing 2–5 small flowers towards the apex.

— 615. We have very lately received specimens from Canton, China, from our friend Dr Hooker, and examined in his rich herbarium the New Holland plant; we cannot perceive the least difference between them.

— 642. Pueraria tuberosa: in Dr Hooker's herbarium there are specimens of the legume, which appears as perfectly jointed as in *Desmodium*, to which genus we fear the present one must be reduced.

— 648. Since the genus Notonia was printed, we have ascertained that De Candolle has also dedicated a genus to Mr Noton in Guillemin's Archives de Botanique for December 1833: although Wight's specimens and lithographic catalogue, containing No. 871 and 872, had been previously distributed, we believe that, according to botanical rules, De Candolle's genus ought to be adopted. We therefore propose to change the name we had given to that of Johnia, in remembrance of the Dr John noticed in our preface, Dr Roxburgh's *Johnia* being identical with *Salacia*. The species will thus be called *J. Wightii* (W. & A.).—To this genus probably also belongs *Dolichos spicatus*, Gr. in Wall. L. n. 5557, but we have neither examined the structure of its flowers nor seen the fruit.

Page 208, line 10 from bottom, *for* mucro above refers, *read* mucro alone refers.

No. 718. *for* Wall.! L. n. 5671, *read* Wall.! L. n. 5761.

Page 258, line 8, *for* 785 (4), *read* 792. *bis* (4).

—— 316. Lumnitzera. Three species of this genus have been described by Gaudishaud in Freycinet's voyage, p. 481, under *Laguncularia*: but these two genera, perhaps, scarcely differ; in *Laguncularia*, however, the petals are minute, the stigma capitate, fruit margined, and leaves opposite; in *Lumnitzera* the petals are twice the length of the calyx-limb, the stigma acute, fruit bluntly angled, and leaves alternate: *Laguncularia* belongs to the northern, *Lumnitzera* to the southern hemisphere. Gaudichaud's *Lag. purpurea*, from the Falkland Islands, is so closely allied to *Lum. racemosa*, that he quotes for it also Rheede's figure, although Rheede says, " flores candidi:" *Lag. rosea*, Gaud., from Manilla, appears to be our *Lum. coccinea*.

No. 1114. *add* Celosia corymbosa, *Roxb. in I. C. mus. tab.* 587.

— 1128. *add* Russelia Oldenlandioides, *Roxb. in E. I. C. mus. tab.* 591.

— 1129. *add* Russelia viscosa, *Roxb. in E. I. C. mus. tab.* 592.

— 1203. *add* V. Wightianum, *Wall. pl. As. rar.* 2. *p.* 29.

— 1208. *add* N. sterculiæfolia, *Ach. Rich. in Mem. de la Soc. Hist. Nat. p.* 289.

— 1209. Having only just seen M. Ach. Richard's memoir on the Rubiaceæ, in the 5th volume of the Mem. de la soc. d'hist. nat. de Paris, we may mention, that he continues to unite *Ceph. chinensis*, Lam. to *N. purpurea*, and forms of them a new genus, which he places in the tribe *Isertiæ* (distinguished by a drupaceous fruit, containing several many-seeded nuts). We ourselves have not seen the fruit, but Roxburgh's description of it is at variance with that given by Richard: perhaps M. Richard may have examined the *Ce-*

Digitized by Google

phalanthus chinensis of Lamarck, while Roxburgh's *N. purpurea* may be distinct. To the one or the other, but most probably to Lamarck's plant, but we have not seen the fruit, seems to belong *N. rotundifolia*, Hook. and Arn. in bot. Beech. voy. p. 64. (probably not of Bartling) from Tahiti (Beechey), and islands of Huahaine and Ulitea (Mathews, n. 90). Richard thus names and characterises his new genus:—

ANTHOCEPHALUS. *A. Rich.*

Flowers densely capitate, arranged on a globose common receptacle, slightly pedicellate. Calyx-limb 5-partite, persistent. Corolla long-tubular; limb 5-partite. Style much exserted. Stigma 2-lobed, lobes approximated. Fruit covered with the limb of the calyx, containing 4 cocci; cocci ovoid, coriaceous, sparingly fleshy on the outside, 1-celled, indehiscent, truncated at the base, 4–5-seeded.—Small tree, with opposite leaves, interpetiolar stipules, and terminal solitary heads of flowers.

1. A. *Indicus* (Rich.)—" Cephalanthus chinensis, *Lam.*—Nauclea purpurea, *Roxb.*"—Rich.

Page 407, line 28, *for H. Leschenaultii, read H. Leschenaultiana*, W. & A. (not DC.)

No. 1259, *add* If De Candolle's *H. Leschenaultii* be retained, our *H. Leschenaultiana* may be called *H. villosa.*

Omitted at page 446.

Page 15, line 12, *delete* Ciss. glabra, Roxb. hort. Bengh. p. 74, *and add*, at line 30,—We were disposed to refer *C. glabra* of Roxburgh to this on the authority of a specimen we examined: it is, however, very distinct, and belongs to the genus *Clypea*, differing from *Cl. hernandifolia* by the flowers being on long pedicels and the whole plant glabrous; we have reason to believe that it is this very species which has been described by De Candolle as *Cocculus Roxburghianus.*

Digitized by Google

INDEX.

[From many of the names we have adopted being also adduced as synonyms to other species, we have found it impossible to distinguish the two in the usual way, without enlarging the Index much beyond its present extent.—The genera of which we have given characters, and the new ones we have indicated, are printed in SMALL CAPITALS. The Figures refer to the page.]

ABELMOSCHUS 53.—A. angulosus 53, esculentus 53, ficulneus 53, moschatus 53, rugosus 53.
Abrineæ 236.
ABROMA 65.—A. angulata 65, augusta 65, Wheeleri 65.
ABRUS 236.—A. fruticulosus 236, minor 236, pauciflorus 236, precatorius 236.
ABRUTILON 55.—A. Asiaticum 56, crispum 56, graveolens 56, hirtum 56, Indicum 56, periplocifolium 55, polyandrum 55, tomentosum 56.
ACACIA 272.—A. alliacea 278, amara 274, 275, Arabica 272, 277, Arrar 278, cæsia 277, 278, canescens 277, Catechu 272, 273, Catechuoides 272, Chundra 273, cineraria 278, cinerea 271, concinna 277, Coronja 276, Dalea 271, dumosa 274, eburnea 276, Farnesiana 272, ferruginea 273, frondosa 275, glauca 276, Indica 272, Intsia 278, Intsioides 278, latronum 273, Lebbek 275, leucocephala 277, lomatocarpa 275, megaladena 277, Nellyrenza 274, nitida 269, odoratissima 275, pennata, 277, planifrons 276, polyacantha 272, 273, procera 275, Roxburghii 276, rugata 278, scandens 268, Sirissa 275, Smithiana 274, speciosa 275, stipularis 274, Sundra 273, tomentosa 274, 276, umbraculifera 273, Wallichiana 272, Wightii 274, Xylocarpa 269.
Acacieæ 267.
Acajuba 168.—A. occidentalis 168.
Aceratium 82.
Achyranthes corymbosa 358.
Acronidia 82.
ACROTREMA 6.—A. costatum 6, Wightianum 6.
Adambea glabra 308, hirsuta 309.
ADANSONIA, 60.—A. digitata, 61.
ADENANTHERA 271.—A. aculeata 272, Pavonina 271.
Adenosacme 402.
ADONIS 3.—A. æstivalis 3.
ÆGLE 96.—A. Marmelos 96, sepiaria 97.
ÆSCHYNOMENE 216, 218.—Æ. aquatica 219, aspera 219, bispinosa 215, cannabina 215, coccinea 216, diffusa 215, 219, grandiflora 215, 216, hirta 220, Indica 214, 219, lagenaria 219, pilosa 219, procumbens 215, pubescens 220, pumila 219, Roxburghii 219, Sesban 214, spinulosa 215, subviscosa 219, Surattensis 218, Suyminta 214, triflora 229, uliginosa 215, viscidula 219.
AGATI 215.—A. coccinea 215, grandiflora 215.
Aglaia 116.—A. decandra 119, odorata 118, polystachya 119.
Ailantheæ 150.

Digitized by Google

Ailanthus 150.—A. excelsa 150, glandulosa 150, Malabarica 150.
Aizoideæ 361.
Alangieæ 174, 325.
Alangium 325.—A. decapetalum 325, hexapetalum 78, 325, 326, tomentosum, 325.
Aldrovanda 34.—A. verticillata 34, vesiculosa 34.
Alhageæ 232.
Alhagi 232.—A. mannifera 232, Maurorum 232.
Allophyllus ornithrophoides 110, pinnatus 110, ternatus, 110.
Althæa 45.—A. Chinensis 46, Coromandeliana 45, 46, flexuosa 46.
Alysicarpus 232.—A. bupleurifolius 233, cylindraceus 234, diversifolius 233, glumaceus 234, Heyneanus 234, longifolius 233, ludens 233, 234, monilifer 232, nummularifolius 232, pilifer 234, Rubibarna 233, scariosus 234, Styracifolius 234, 235, vaginalis 233, 234, varius 233, Wallichii 234.
Ameletia 303.—A. Indica 303, polystachya 304.
Ammannia 304.—A. baccifera 305, Caspica 304, coccinea 304, cordata 304, densiflora 305, glauca 305, Heyneana 306, Indica 303, 305, lanceolata 304, latifolia 306, multiflora 306, nana 305, octandra 304, parviflora 306, pentandra 305, 306, repens 303, rosea 306, rotundifolia 306, rubra 306, triflora 307, verticillata 304, vesicaria 305.
Ammi Indicum 365.
Amminèæ 367
Amoora 119.—A. cucullata 119, 121, Rohituka 119.
Ampelideæ 124.
Ampelopsis ternata 131.
Amyrideæ 167.
Amyris acuminata 96, 176, Agallocha 96, anisata 95, Commiphora 96, dentata 96, Gileadensis 177, graveolens 95, heptaphylla 95, nana 95, pentaphylla 95, punctata 95, simplicifolia 93, spinosa 177, suffruticosa 95, 96, Sumatrana 95, Zeylanica 175.
Anacardieæ 167.
Anacardium 168.—A. latifolium 168, occidentale 168, officinarum 168.
Anamirta 446.—A. Cocculus 446, paniculata 446.
Ancistrocladus 107.—A. Heyneanus 107.
Andersonia acuminata 316, lanceolata 316, Rohituka 119.
Anemone 3.—A. dubia 3, Wightiana 3.
Anethum 371.—A. Fœniculum 371, graveolens 372, Panmori 371, 375, Sowa 372
Angolamia 325.
Anogeissus 316.—A. acuminatus 316, latifolius 316.
Anoma Moringa 178, Morunga 178, 449.
Anona 7.—A. hexapetala 10, reticulata 7, squamosa 7, uncinata 10.
Anonaceæ 7.
Anotis 409.—A. rotundifolia 409.
Anthocephalus 450.—A. Indicus 450.
Anthodon 104.
Aphanamixis 119.—A. Timorensis 119.
Apium 367.—A. Celeri 367, graveolens 367, involucratum 369, trifoliatum 368.
Apocynum fœtidum 424.
Aporetica pinnata 113, ternata 110.
Aquilicia 131.—A. Ottilis 132.
Arachis 279.—A. Africana 280, Asiatica 280, fruticosa 218, hypogea 280.
Aralia 376.—A. Chinensis 376, digitata 377, octophylla 376, palmata 376, umbraculifera 94.
Araliacea Kleinii 375.
Araliaceæ 375.
Arbor-alba Javanica 326, minor 326.
Arenaria 43.—A. Neelgherrense 43.

Digitized by Google

Argemone 17.—A. Mexicana 18.
Aristotelia 82.
Arsis rugosa 81.
Artabotrys 9.—A. odoratissimus 10.
Asclepias armata 65.
Aspalathus Indicus 199.
Astragalus biflorus 190.
Astronium 325.
Atalantia 90.—A. bilocularis 94, capitellata 91, monophylla 91, 94, racemosa 91, 448.
Athamantha Adjowan 368, Roxburghiana 369.
Atragene 2.—A. Zeylanica 2.
Atylosia 257.—A. Candolii 257, lineata 257, major 257, rugosa 257.
Aubertia 148.
Aurantiaceæ 90.
Averhoa 141.—A. Bilimbi 142, Carambola 141.
Azadirachta 117.—A. Indica 118.

Badamia 313.
Balanopteris minor 63, Tothila 63.
Balsamaria Inophyllum 103.
Balsamina 135.—B. coccinea 136, fasciculata 139, fruticosa 137, heterophylla 139, hortensis 136, latifolia 138, Leschenaultii 136, minor 140, Mysorensis 137, oppositifolia 139, scabriuscula 136, Tilo 138.
Balsamineæ 134.
Balsamodendron 177.—B. Gileadense 177, Zeylanicum 175.
Banisteria Benghalensis 107, unicapsularis 107.
Baraldeia Madagascariensis 312.
Barringtonia 333.—B. acutangula 333, racemosa 333, 334, speciosa 333.
Batschia laurifolia 285.
Bauhinia 294.—B. acuminata 295, anguina 298, candida 295, 296, Coromandeliana 296, emarginata 297, Malabarica 294, parviflora 295, phœnicea 296, piperifolia 298, purpurea 295, 296, 297, racemosa 295, 297, scandens 297, spicata 295, triandra 297, Vahlii 297, variegata 296, 297.
Benincasa 344.—B. cerifera 344.
Ben Kadali 323.
Berberideæ 15.
Berberis 15.—B. Leschenaultii 16, Nepalensis 16, tinctoria 16.
Berchemia 163.—B. floribunda 163, parviflora 163, volubilis 163.
Bergera 90, 94.—B. integerrima 94, Kœnigii 94, 96, villosa 94.
Bergia aquatica 41, Capensis 41, pentandra 41, verticillata 41.
Berrya 81.—B. Ammonilla 81.
Bessera inermis 29.
Bigelowia 437.—B. Kleinii 437, 438, lasiocarpa 437, ramosa 437, Roxburghiana 437, 438.
Bikkia 402.
Biophytum 142.—B. sensitivum 142.
Bixa 31.—B. Orellana 31.
Bixineæ 31.
Blepharanthes 353.
Blighia 113.
Bombaceæ 60.
Bombax 61.—B. ceiba 61, Gossypium 87, heptaphyllum 61, Malabaricum 61, orientale 61, pentandrum 61.
Bombicella 51.
Bonnaya 139.
Borreria 437.—B. ocymoides 437.
Boswellia 174.—B. glabra 174, hirsuta 174, serrata 174, thurifera 174.

Digitized by Google

Brachypterum 264.
Brassica oleracea 19.
Braunea Menispermoides 13, 15.
Bremontiera ammoxylon *var.* Burmanni 202.
Brotera ovata 67, 68.
Brucea 150.
Bruguiera 311, 316.—B. cylindrica 311, gymnorhiza 311, Madagascariensis 316.
Bryonia 344.—B. althæoides 345, amplexicaulis 346, callosa 347, cheirophylla 347, epigæa 346, Garcini 344, glabra 346, grandis 347, Hookeriana 345, laciniosa 345, leiosperma 345, Maderaspatana 345, Maysorensis 345, Moimoi 347, palmata 346, 348, pilosa 347, punctata 347, reniformis 344, Rheedei 346, rostrata 346, Rottleri 345, scabra 345, scabrella 342, 345, sinuosa 345, tubiflora 347, umbellata 345, 346, Wightiana 347.
Bryophyllum 360.—B. calycinum 360.
Bryum 401.
Bubroma tomentosum 65.
Buchaniana 169.—B. angustifolia 169, latifolia 169, paniculata 119.
Buchozia 440.—B. coprosmoides 441.
Bupleurum 369.—B. distichopyllum 370, longicaule 370, mucronatum 370, ramosissimum 370, tenue 370, virgatum 370.
Bursera acutifolia 171, paniculata 175, serrata 177.
Burseræ 167, 173.
Butea 261.—B. frondosa 261, parviflora 261, superba 261.
Butonica 333.—B. speciosa 333, 334.
Byttneria 65.—B. Carthaginensis 65, herbacea 65.
Byttneriaceæ 61, 174.
Byttnerieæ 64.

Cacara 251.
Cacao minus 64, sativa 64.
Cactæ 363.
Cactus 363.—C. Dillenii 363, Indicus 363.
Cadaba 24.—C. Indica 24, trifoliata 24, tryphylla 24.
Cadamba jasminiflora 422.
Cæsalpinia 280.—C. armata 282, axillaris 280, Bonduccella 280, Crista 281, cucullata 283, digyna 281, elata 282, grandis 283, horrida 282, inermis 282, lacerans 283, ligulata 283, mimosoides 281, olcosperma 281, paniculata 281, pulcherrima 282, Sappan 281, scandens 281, Sepiara 282, Simora 281.
Cæsalpinieæ 279.
Cajanus 256.—C. albicans 256, bicolor 256, flavus 256, Indicus 256, lineatus 258, suaveolens 240, scarabæoides 256, Wightii 256.
Calanchoe pinnata 360.—*See* Kalanchoe.
Callitriche 339.—C. verna *var.* vulgaris 339, Wightiana 339.
Callitrichineæ 339.
Calophyllum 102.—C. Akara 5, 107, apetalum 103, Bintagor 103, Calaba 103, Calaboides 103, Inophyllum 103, longifolium 103, 448, Nagassarium 102, spurium 103, Wightianum 103.
Calpandria 116.
Calycifloræ 155.
Calycopteris 315.—C. floribunda 315.
Calypso 104.—C. campestris 104.
Calyptranthes caryophyllata 329, caryophyllifolia 329, Jambolana 329.
Cambessedia 169, 170.
Cambogia Gutta 100, 102.
Campesia 206.
Canarium 112, 173, 174.—C. balsamiferum 174, commune 175, hirsutum 174, Mchenbethene 175, Sajiga 175, strictum 175.

Digitized by Google

Canavalia 252.—C. gladiata 253, mollis 253, obtusifolia 253, virosa 253.
Cantharospermum 255, 257.—C. albicans 256, pauciflorum 255.
Canthium 425, 426.—C. anomocarpum 425, Chinense 398, corymbosum 401, cymosum 425, didymum 401, 425, 426, Leschenaultii 426, nitens 426, parviflorum 426, Rheedei 426, thyrsoideum 403.
Capparese 23.
Cappariderae 21.
Capparis 24.—C. acuminata 25, 26, Aguba 26, angustifolia 27, apetala 23, aphylla 27, bisperma 26, brevispina 24, 27, cœrulea 27, corymbosa 26, divaricata 27, diversifolia 27, grandiflora 25, grandis 26, 27, 28, heteroclita 24, heterogenea 447, Heyneana 25, horrida 25, 26, 27, incanescens 26, linifolia 23, Malabarica 28, maxima 26, 27, obovata 27, pedunculosa 27, pyrifolia 25, 26, quadriflora 26, racemifera 27, reticulata 27, Rheedei 25, rotundifolia 25, Roxburghii 26, sepiaria 26, 447, stylosa 25, 26, terniflora 26, trifolia 23, 447, uncinata 28, Wallichiana 25, 26, Wightiana 25, Zeylanica 25, 26, 447.
Caprifoliaceæ 387.
Capsella 20.—C. Bursa-pastoris 20.
Carallia 311.—C. Baraldeia 312, lanceolata 312, lucida 312.
Carapa Moluccensis 121.
Cardamine 19.—C. Borbonica 20, hirsuta 20, parviflora 20, Pensylvanica 20, sylvatica 20, teres 20, umbrosa 20, Virginica 20, Wightiana 20.
Cardiospermum 109.—C. canescens 109. Halicacabum 109.
Careya 332, 334.—C. arborea 334, macrostachya 333, 334, sphærica 334.
Carica 352.—C. Papaya 352.
Carpopogon 253, 254.—C. atropurpureum 254, giganteum 254, monospermum 254, niveum 255, pruriens 255.
Caryolobus Indica 85.
Caryophyllaceæ 41.
Caryophylleæ 41.
Cassia 285.—C. absus 291, acutifolia 288, alata 287, amœna 292, angustissima 292, 293, arborescens 289, auriculata 290, bicapsularis 286, bracteata 287, Coromandeliana 287, dimidiata 293, enneaphylla 289, esculenta 287, fastigiata 290, Fistula 285, florida 288, fœtida 290, Gallinaria 290, glauca 289, herpetica 287, Indica 287, Javanica 286, Kleinii 293, lanceolata 288, Leschenaultiana 292, 293, marginata 286, mimosoides 292, 293, montana 289, multiglandulosa 286, myriophylla 292, obovata 288, obtusa 288, obtusifolia 290, occidentalis 287, 290, orientalis 288, planisiliqua 289, Porturegalis 288, prostrata 292, pumila 292, purpurea 287, rhombifolia 286, Roxburghii 286, 292, senna 288, sennoides 286, sensitiva 292, setigera 289, sophera 287, 290, sopheroides 287, speciosa 289, suffruticosa 289, 290, sulphurea 289, Sumatrana 288, Surattensis 289, Tagera 291, Telfairiana 292, tenella 292, tomentosa 286, Tora 290, Toroides 291, torosa 287, torulosa 287, viscosa 291, Wallichiana 292, 293, Wightiana 286.
Cassieæ 280.
Cassipourea 312.
Cassuvium 168.—C. pomiferum 168.
Castalia edulis, 447.
Catappa 312.—C. Benzoin, 313.
Catha emarginata 160, montana 160, Wallichii 159, Zeylanica 165.
Catjang 249.
Caucalineæ 374.
Caucalis Anthriscus 374, elata 374.
Ceanothus Africana 166, Asiaticus 166, capsularis 166, circumscissa 165, paniculata 158, Wightiana 164, Zeylanica 165.
Cedrela 123.—C. febrifuga 124, hexandra 124, Toona 124, villosa 124.
Cedrelaceæ 121.
Cedrelæ species 123.

Digitized by Google

Ceiba pentandra 61.
Celastrineæ 155, 448.
Celastrus 158.—C. bivalvis 158, buxifolia 159, crenata 160, dependens 158, emarginata 159, 160, Heyneana 159, micrantha 158, monosperma 158, montana 159, multiflora 158, nutans 158, obtusifolia 158, opposita 157, ovata 155, paniculata 158, pterocarpa 158, pyracantha 158, rigida 159, robusta 158, Rothiana 158, serrulata 159, striata 158, trigyna 158, verticillata 154, 158, Wallichiana 159, 160, Wightiana 157, Zeylanica 165.
Celosia corymbosa 358, 449.
Celtis 161.
Cephalanthus Chinensis 392, 449, 450, orientalis 391, pilulifer 391.
Cephalaria alpina 445.
Cerastium 42.—C. Indicum 43, vulgatum 43.
Ceratophylleæ 309.
Ceratophyllum 309.—C. demersum 309, 310, Indicum 309, Missionis 309, 310, muricatum 309, tuberculatum 309, verticillatum 309.
Cercodeæ 337.
Cercodia 338.
Ceriscus Malabaricus 397.
Chadara tenax 80.
Chalaria 242.
Chalcas Japonensis 94, paniculata 94.
Chamæfistula 286.
Chamæsenna 288.
Cheiranthus Farsetia 19, maritimus 19.
Chickrassia 122.—C. tabularis 123.
Chilmoria pentandra 447.
Chloroxylon 123.—C. Swietenia 123.
Chomelia 400.
Cicer 235.—C. arietinum 235, lens 235, nummulariæfolium 190.
Cinchona excelsa 392, obovata 392.
Cinchonaceæ 390.
Cinchoneæ 392.
Circæaceæ 335.
Cissampelos 14.—C. cocculus 13, 15, convolvulacea 13, 14, 15, discolor 14, glabra 14, 15, 450, hernandifolia 14, 15, hexandra 14, hirsuta 15, Mauritiana 15, orbiculata 15, ovata 14, Pareira 15, Pata 15.
Cissus 125.—C. acida 127, acutifolia 129, adnata 126, angulata 126, auriculata 129, carnosa 127, cinerea 127, cordata 126, elongata 128, 129, fœminea 127, glauca 126, heptaphylla 129, heterophylla 127, inæqualis 125, Indica 125, 126, Japonica 129, lanceolaria 128, latifolia 126, Nepalensis 129, obtusifolia 127, paniculata 129, pedata 129, purpurea 126, quadrangularis 125, repanda 125, repens 126, serratifolia 128, serrulata 129, setosa 127, sicyoides 125, trilobata 127, vitiginea 125, 126, 127.
Citrus 97.—C. angulata 91, Aurantium 97, Bergamia 98, buxifolia 98, Decumana 97, hystrix 98, Limetta 98, Limonellus 98, Limonum 98, Lumia 98, medica 98, nobilis 97, vulgaris 97.
Citta 253, 254.
Cladrastis lutea 179.
Clausena 90, 95.—C. nana 96, pubescens 96, suffruticosa 96, Willdenowii 96.
Clavulium pedunculosum 193.
Clematis 1.—C. Gouriana 2, 446, Indica 2, triloba 2, Wightiana 2.
Cleome 21.—C. aspera 22, Burmanni 22, Chelidonii 22, 447, diffusa 447, dodecandra 22, fruticosa 24, 447, icosandra 22, 447, monophylla 21, 447, pentaphylla 21, 447, tenella 21, viscosa 22.
Cleomeæ 21.
Cleyera 86.—C. gymnanthera 87, Lushia 87, Millettii 87, ochnacea 87, ochnoides 87.

Digitized by Google

Clitoria 205.—C. Ternatea 205.
Clitorieæ 208.
Clypea 14.—C. Burmanni 14, hernandifolia 14, 450.
Cnestis 143.—C. emarginata 144, florida 144, mimosoides 144, monadelpha 144.
Coccinea 347.—C. Indica 347.
Cocculus 11.—C. acuminatus 12, aristolochiæ 13, Burmanni 14, convolvulaceus 12, cordifolius 12, crispus 12, flavescens 12, glaber 13, lacunosus 12, lævis 13, macrocarpus 13, Malabaricus 12, orbiculatus 12, ovalifolius 13, peltatus 14, Plukenetii 13, polycarpus 12, radiatus 12, Roxburghianus 14, 450, sepium 13, suberosus 11, 446, verrucosus 13, 15, villosus 13, 15, Wightianus 14.
Cochlospermum 87.—C. Gossypium 87.
Coffea 435.—C. Arabica 435, Benghalensis 435, Travancorensis 435, Wightiana 435, 436.
Coffeeæ 424, 425.
Colbertia Coromandeliana 5.
Collæa gibba 258, 259, trinervia 257, venosa 258.
Colophonia Mauritiana 175.
Colubrina 165.—C. Asiatica 166.
Colutea Wightiana 209.
Combretaceæ 312.
Combreteæ 317.
Combretum 317.—C. albidum 317, alternifolium 316, Heyneanum 317, laxum 317, 318, ovalifolium 317, pilosum 317, Roxburghii 317, squamosum 317, Wightianum 317.
Commersonia herbacea 65.
Condondum 170, 173.
Conium Siva 373.
Connaraceæ 143, 262.
Connarus 143.—C. microphyllus 144, monocarpus 143, 144, pinnatus 143, Roxburghii 144, santaloides 144.
Conocarpus 315.—C. acuminatus 316, latifolius 316.
Cookia 90, 95.—C. chlorosperma 92, cyanocarpa 92, falcata 95, graveolens 95, macrophylla 95, punctata 95.
Corchorus 72.—C. acutangulus 73, æstuans 73, Burmanni 73, capsularis 73, decemangularis 73, fascicularis 72, fuscus 73, linearis 72, 73, olitorius 73, subscandens 73, tridens 73, trilocularis 72, 73, urticæfolius 73.
Coronilla aculeata 215, cannabina 215, coccinea 216, Cochinchensis 215, grandiflora 216, Sesban 214.
Corynandra pulchella 22.
Cotoneaster buxifolia 302.
Cotyledon calycina 360, corymbosa 360, heterophylla 360, laciniata 360, paniculata 360, pinnata 360, rhizophylla 360.
Crassulaceæ 359.
Cratægus Bibas 302.
Cratæva 20.—C. apetala 23, inermis 23, Marmelos 97, Nurvala 23, oblongifolia 24, odorata 23, religiosa 23, Roxburghii 23, Tapia 23, Vallanga 96.
Crotalaria 180, 197.—C. affinis 180, albida 188, 189, angulosa 187, anthylloides 181, barbata 181, Benghalensis 185, bifaria 188, 189, biflora 190, 191, Brownei 180, cæspitosa 190, calycina 181, candicans 184, canescens 189, cephalotes 182, Chinensis 182, 183, clavata 188, 194, cœrulea 187, crassifolia 189, crenata 181, cytisoides 180, dichotoma 188, diffusa 190, digitata 194, 195, divaricata 192, elliptica 193, evolvuloides 188, fenestrata 185, ferruginea 189, foliosa 192, formosa 186, fulva 183, genistoides 191, globosa 190, Grahamiana 194, herniarioides 192, heterophylla 194, Heyneana 187, hirsuta 182, 188, 189, hirta 182, 190, incana 180, juncea 185, 186, laburnifolia 193, lanceolata 180, latifolia 180, Leschenaultii

Digitized by Google

186, linearis 181, linifolia 189, 190, longipes 183, lunulata 183, lupiniflora 186, macrophylla 241, Madurensis 184, medicaginea 192, 449, melanocarpa 191, montana 182, 190, Mysorensis 182, nana 191, Napalensis 181, neglecta 192, nervosa 197, Notonii 192, Nummularia 190, 191, obliqua 189, obtecta 185, Orixensis 192, 193, ovalifolia 181, paniculata 183, 449, parva 189, peduncularis 186, pedunculosa 193, pellita 183, pendula 193, pilosa 182, porrecta 185, procumbens 192, 193, prostrata 189, pulcherrima 184, pulchra 184, punctata 189, pusilla 189, quinquefolia 194, ramosissima 183, 194, retusa 186, 187, rigida 191, rostrata 191, Rothiana 190, Rothii 190, Roxburghiana 181, rubiginosa 181, 188, salicifolia 182, scabrella 181, scoparia 189, semperflorens 189, sericea 185, 186, sobolifera 190, spartioides 191, speciosa 182, spectabilis 186, stipitata 193, stipulacea 182, striata 180, stricta 181, 192, subperfoliata 184, tecta 190, tenuifolia 185, tetragona 185, tomentosa 183, 194, triflora 189, trifoliastrum 191, 192, 193, tuberosa 238, umbellata 191, uncinella 193, uniflora 181, Vachellii 193, verrucosa 187, viminea 185, 189, virgata 192, Wallichiana 187, Wightiana 181, Willdenowiana 191.
Croton Benzoe 313.
Cruciferæ 18.
Cubospermum palustre 335.
Cucumis 341.—C. acutangulus 343, anguinus 350, chæta 341, citrullus 351, Colocynthis 342, 351, flexuosus 342, maculatus 342, Maderaspatanus 342, 345, Melo 341, Missionis 343, Momordica 341, muricatus 341, operculatus 343, pentandrus 343, prophetarum 342, pubescens 342, pyrifolius 342, sativus 342, trigonus 342, tuberosus 344, tubiflorus 348, turbinatus 342, utilissimus 342.
Cucurbita 350.—C. alba 344, cerifera 344, Citrullus 351, dioica 344, Lagenaria 341, maxima 351, Melopepo 351, Pepo 344, 351, polymorpha *var.* oblonga 351, umbellata 344.
Cucurbitaceæ 340.
Cucurbiteæ 341.
Cumbea Coneanæ 334.
Cumineæ 373.
Cuminum 373.—C. Cyminum, 373.
Cupania 112.—C. canescens 113.
Cupia 401, 431.—C. auriculata 401, corymbosa 401, cymosa 401, 425, densiflora 401, odorata 401, oppositifolia 401, scandens 401, thyrsoidea 401, 403, truncata 401.
Curtisia 155.
Cussámbium glabrum 114, pubescens 114.
Cyamopsis 196.—C. psoraloides 197.
Cyanospermum 259.—C. tomentosum 260
Cylista 259.—C. albiflora 260, ferruginea 258, reticulata 240, suaveolens 240, scariosa 237, 259, tomentosa 260, villosa 259.
Cyminosma 146.—C. Ankænda 147, pedunculata 147.
Cynometra 293.—C. cauliflora 293, pinnata 262, polyandra 294, ramiflora 293.
Cyrilla Indica 364, Oldenlandioides 364, viscosa 364.
Cyrtolobus 191, 193.
Cytisus Cajan 256, pseudo-cajan 256, sericeus 210

Dalbergia 210, 263.—D. arborea 262, 266, congesta 265, frondosa 266, horrida 266, lanceolaria 266, latifolia 264, paniculata 265, rubiginosa 265, scandens 262, 264, 266, Sissoo 264, Sissooides 265, spinosa 266, tephrosioides 210, volubilis 265.
Dalbergieæ 361.
Dalrymplea 156.
Dammara Selanica 85.

Digitized by Google

Daucineæ 373.
Daucus 374.—D. Carota 374.
Decadia 82.
Decaschistia 52.—D. crotonifolia 52.
Delphinium 4.—D. Ajacis 4, pauciflorum 4.
Dendrolobium 223.
Dentella 405.—D. erecta 405, repens 405.
Derris pinnata 263.
Desmanthea 270.
Desmanthus 270.—D. cinereus 271, natans 270, triquetrus 270, virgatus 270.
Desmocarpus Missionis 24.
Desmodium 205, 223, 224.—D. alatum 225, angulatum 228, Canadense 228, capitatum 228, cephalotes 224, collinum 225, confertum 224, congestum 224, dichotomum 226, diffusum 226, elongatum 226, Gangeticum 225, 226, gyrans 227, gyroides 227, heterocarpum 228, heterophyllum 229, Hippocrepis 228, latifolium 225, lutescens 224, 230, maculatum 225, 226, nudiflorum 229, orbiculatum 223, paniculatum 229, parvifolium 229, podocarpum 229, polycarpum 227, pseudotriquetrum 225, punctatum 239, purpureum 228, recurvatum 226, reniforme 230, retroflexum 223, rotundifolium 223, Roxburghii 226, Roylei 227, rufescens 227, 228, scorpiurus 227, serpens 228, siliquosum 228, stipulaceum 229, strangulatum 228, 231, sulcatum 226, tenue 228, triflorum 228, 229, 230, triquetrum 224, 225, umbellatum 224, viscidum 209, Wightii 226.
Desmos Chinensis 9.
Dianthus Chinensis 42.
Dicera dentata 82, serrata 82.
Dicerma 230.—D. biarticulatum 230, elegans 224, 230, pulchellum 230.
Dichrostachys 271.—D. cinerea 271.
Dillenia 5.—D. dentata 6, elliptica 5, Indica 5, 446, pentagyna 5, retusa 6, speciosa 5.
Dilleniaceæ 4.
Dillwynia trifoliata 195.
Dimereza 113.
Dimetia 406.
Dimocarpus Longan 113, undulatus 113.
Diplopetalum 113.
Diplophragma 406.
Diplospora 401.
Diplostemon 304.
Dipsaceæ 444.
Dipsacus 444.—D. Leschenaultii 445.
Dipterocarpeæ 83.
Dipterocarpus 84.—D. alatus 84, angustifolius 84, costatus 84, incanus 84, lævis 85, scaber 84, turbinatus 85.
Disoxylon multijugum 121.
Ditheca 304.
Dodonæaceæ 114.
Dodonæa 114.—D. angustifolia 114, Burmanniana, 114, bialata 115, Jamaicensis 115, spathulata 115, viscosa 115.
Dolichos 247, 250, 251, 252.—D. albus 251, arboreus 262, argenteus 249, Benghalensis 251, biflorus 248, bulbosus 251, Catjang 249, 250, ciliatus 249, cultratus 251, cuspidatus 251, ensiformis 251, 253, fabæformis 197, falcatus 246, 249, giganteus 254, gladiatus 253, glutinosus 248, Lablab 251, lignosus 251, medicagineus 239, 256, minutus 256, obtusifolius 253, ovatus 252, pilosus 249, prostratus 249, pruriens 255, psorabioides 197, punctatus 247, purpureus 251, rotundifolius 253, rufescens 237, scarabæoides 239, 256, Sinensis 250, Soja 247, Soorootoo 255, spicatus 251, 449, stipulaceus 246, subcarnosus 249, tetragonolobus 252, tetraspermus

Digitized by Google

251, tomentosus 248, Tranquebaricus 250, trilobatus 249, trilobus 246, tuberosus 249, uniflorus 248, urens 254, virosus 253, Woolawa 248.
Dombeya 67.—D. palmata 68, phœnicea 67.
Dombeyaceæ 67.
Dondisia 427.—D. Leschenaultii 427.
Doodia alopecuroides 222, hamosa 222, logopodoides 222, picta 222.
Doosera esculenta 362.
Drosera 13.—D. Burmanni 34, Indica 34, intermedia 34, longifolia 34, lunata 34, peltata 34.
Droseraceæ 33.
Droseræ 33.
Duchesnia fragariodes 300, fragiformis 300.
Dumasia 206.—D. congesta 206, villosa 206.
Dunbaria 258.—D. ferruginea 258, Heynei 258, latifolia 258.
Dysoda 440.—D. fasciculata 441, fœtida 241.

Ehrenbergia tribuloides 145.
Ekebergia Indica 118.
Elæagnus 163.
Elæocarpeæ 81.
Elæocarpus 82.—E. adenophyllus 83, bifidus 82, bilocularis 83, copalliferus 84, Ganitrus 82, integrifolius 82, nitidus 82, oblongus 82, Perim-Kara 82, serratus 82, 83, serrulatus 83, tuberculatus 83, Varunua 83.
Elæodendron 156, 157.—E. glaucum, 156, 157, 448, Neelgherrense 161, orientale 156, paniculatum 157, Roxburghii 156, 157, viride 156.
Elatine 21.—E. æstivosa 41, ambigua 41, ammanoides 41, luxurians 41, verticillata 41, 399.
Elatineæ 40.
Eleiotis 231.—E. monophylla 231, Rottleri 331, sororia 231.
Entada 267.—E. monostachya 268, Parrana 268, Pusætha 267, Rheedei 268.
Epicharis exarillata 120.
Epilobium fruticosum 336.
Epicorollæ Corisantheræ 378.
Epipetalæ 365.
Epithynia 423.—E. Malayana 424.
Eriobotrya 302.—E. Japonica 302.
Eriochlæna 70.—E. Hookeriana 70.
Eriochlæneæ 70.
Eriodendron 61.—E. anfractuosum 61.
Erioglossum 111, 112.
Eruca sativa 19.
Ervum 235.—E. dispermum 235, filiforme 236, hirsutum 235, Lens 235, 236, lenticula 235, monanthos 235, pendulum 235.
Erythrina 260.—E. alba 261, corallodendron 260, Indica 260, maxima 261, monosperma 261, picta 260, stricta 260, suberosa 260, 261, sublobata 261.
Erythroxyleæ 106.
Erythroxylon longifolium 106, Mauritianum 106, monogynum 106, sideroxyloides 106.
Eudalbergia 264.
Eudolichos 249.
Euhedyotis 411.
Euhedysareæ 216.
Eugenia 330.—E. acris 331, acutifolia 333, alba 332, aquea 332, bracteata 331, calyptrata 329, caryophyllifolia 329, corymbosa 330, cuneata 332, Jambolana 329, Jambolifera 329, Jambos 332, læta 331, lanceolata 330, macrophylla 333, Malaccensis 332, obtusifolia 329, Pimenta *var.* ovali-

Digitized by Google

folia 331, purpurea 333, racemosa 333, Rottleriana 331, Roxburghii 331, spicata 330, subcordata 331, Wildenowii 331, Zeylanica 331.
Euonymus 160.—E. crenulatus 161, dichotomus 160, 161, Indicus 160.
Euphaseoleæ 236.
Euphaseolus 243.
Euphoria 113.—E. Longana 113.
Eupyrena 422.—E. glabra 423.
Eurhynchosia 238.
Eurya 86.—E. angustifolia 86, bifaria 86, fasciculata 86, tristyla 86, Wightiana 86.
Eurycoma 143, 150.
Euspermacoceæ 437.
Eutrichosanthes 349.
Evodia triphylla 148.

Faba vulgaris 235.
Fabricia bracteata 37.
Fagara 148.—F. Rhetsa 148, triphylla 148.
Fagonia 145.—F. Mysorensis 148.
Feronia 96.—F. elephantum 96, pellucida 96.
Ficoideæ 361.
Fissilia Psittacorum 89.
Fistula 286.
Flacourtia 29.—F. Cataphracta 29, crenata 30, inermis 29, 30, Ramontchi 29, sapida 29, sepiaria 29, Wightiana 30.
Flacourtianeæ 28.
Flemingia 241.—F. abrupta 243, congesta 241, 242, ferruginea 242, fructiculosa 243, Grahamiana 242, lineata 242, nana 242, polysperma 197, Rothiana 231, semialata 241, 242, stricta 241, 242, strobulifera 243, Wallichii 242, Wightiana 242.
Flemingiastrum 241.
Fœniculum 370.—F. officinale 371, Panmoricum 371, vulgare 371.
Fragaria 299.—F. elatior 300, Indica 300, Malayana 300, Roxburghii 300, Sundaica 300.
Fumaria 18.—F. officinalis 18, parviflora 18, Vaillantii 18.
Fumariaceæ 18.
Funis musarius angustifolius 9.
Furcaria 48.

Gærtnera laurifolia 107, racemosa 107.
Galactea 206.—G. longiflora 206, tenuiflora 206, 207, villosa 207.
Galari-marum 84.
Galedupa elliptica 263, Indica 262, Piscidia 263.
Galega arborescens 210, argentea 212, barba-Jovis 212, biflora 212, cœrulea 213, Colonila 213, Colutea 200, 212, diffusa 213, Heyneana 213, hirta 213, incana 212, lanceæfolia 213, maxima 214, pentaphylla 214, procumbens 213, prostrata 213, purpurea 213, senticosa 212, spinosa 214, tinctoria 211, 213, villosa 212, 213.
Galium 442.—G. Aparine 442, asperifolium 442, elegans 443, Indicum 443, latifolium 443, parviflorum 442, Requienianum 443.
Ganitrus 82.
Garcinia 100, 121.—G. affinis 101, Cambogia 100, Cochinchenis 100, Cowa 101, Gutta 101, Indica 101, Kydia 101, lanceæfolia 101, Zeylanica 101.
Gardenia 394.—G. arborea 395, calyculata 396, dumetorum 397, enneandra 394, floribunda 398, foliolosa 399, fragrans 400, grandiflora 395, gummifera 395, latifolia 394, 395, longispina 398, lucida 395, 396, montana 396, Naum-papata 425, nutans 397, Pandaki 400, parviflora 425, Pavetta 401,

Digitized by Google

pubescens 396, resinifera 395, speciosa 422, spinosa 397, 398, uliginosa 398.
Gardeniaceæ 393.
Gardenieæ 393.
Garuga 175.—G. Madagascariensis 175, pinnata 175.
Gastonia Nalugu 376, 448.
Geeria glabra 86.
Geissaspis 217.—G. cristata 218.
Gela lanceolata 147.
Gelonium 113.
Gemella trifolia 110.
Genisteæ 181.
Geoffreæ 279.
Geophila 436.—G. diversifolia 436, reniformis 436.
Geraniaceæ 133.
Geranium 133.—G. affine 133, collinum 133, collinum 133, longipes 133, palustre 133.
Gerontegea biflora 415, racemosa 414.
Getonia 315.—G. floribunda 315, nitida 315, nutans 315.
Gilibertia Nalugu 376, 448.
Gimbernatia 315.
Glinus 362.—G. dictamnoides 362, lotoides 362, ononoides 362, trianthemoides 362.
Glycosmis 90, 92.—G. angustifolia 93, arborea 92, chylocarpa 93, macrophylla 92, nitida 93, pentaphylla 93, triphylla 93.
Glycine 208.—G. aurea 237, cana 241, capitata 237, debilis 208, densiflora 239, elongata 237, filiformis 207, 208, humifusa 195, Javanica 208, labialis 208, leptocarpa 195, lineata 258, mollis 209, nummularia 237, pallens 208, parviflora 208, 209, pentandra 208, Pondicherrensis 240, rhombifolia 239, rufescens 239, 240, suaveolens 240, tenuiflora 206, 207, triloba 246, vestita 207, viscida 209, viscosa 248.
Gomphia 152.—G. angustifolia 152, 153, Zeylanica 153.
Goniocarpus 338.—G. tenellus 338.
Gonotheca Blumei 413.
Gordonia 87.—G. obtusa 87.
Gossampinus alba 61, rubra 61.
Gossypium 54.—G. album 54, arboreum 55, Barbadense 55, croceum 55, eglandulosum 54, fuscum 448, glabrum 55, herbaceum 54, hirsutum 54, Indicum 55, Javanicum 55, latifolium 55, micranthum 54, nigrum 54, obtusifolium 54, Peruvianum 55, purpureum 55, racemosum 55, religiosum 55, rubicundum 55, tricuspidatum 54, vitifolium 55.
Gouania 166.—G. leptostachya 166, microcarpa 167, tiliæfolia 167.
Gratiola aromatica 418.
Greenea 402, 403.—G. Jackii 404, Wightiana 404.
Grewia 75.—G. abutilifolia 79, affinis 81, arborea 80, Asiatica 79, aspera 79, betulæfolia 80, bicolor 78, bracteata 76, carpinifolia 76, 78, 79, columnaris 76, commutata 79, Damine 77, didyma 77, disperma 77, emarginata 76, 79, excelsa 77, 78, flavescens 79, glabra 77, helicterifolia 78, hirsuta 78, involucrata 79, lævigata 77, 78, macrophylla 79, Microcos 81, montana 78, obliqua 77, obtusa 76, orbicularis 80, orbiculata 79, 80, orientalis 76, 79, ovalifolia 77, pilosa 77, 78, polygama 78, populifolia 80, rhammifolia 76, Rothii 78, rotundifolia 79, 80, Roxburghii 78, salvifolia 77, 78, scabrida 79, sepiaria 77, serrulata 77, subinæqualis 80, tiliæfolia 80, tomentosa 78, ulmifolia 81, variabilis 80, villosa 79.
Griffithia 399.—G. fragrans 400.
Grislea 307.—G. punctata 308, tomentosa 308.
Grumilea 432, 434.—G. congesta 432, nigra 432, subinteger 432.
Guaiava pyriformis 328.

Digitized by Google

Guarea Alliaria 121, Amaris 121, binectarifera 120, Gobara 121, Gotadhora 120, paniculata 121.
Guatteria 10.—G. acutiflora 8, 11, cerasoides 10, Korinti 10, longifolia 10, Malabarica 8, montana 8, sempervirens 11, suberosa 10.
Guazuma 64.—G. tomentosa 64, ulmifolia 64.
Guettarda 421.—G. speciosa 422,
Guettardaceæ 418.
Guettardeæ 421,
Guilandina 280.—G. axillaris 280, Bonduc 280, 281, Bonduccella 280, Moringa 178, oleosperma 281, paniculata 281.
Guioa 113.
Guttiferæ 100.
Gymnosporia 159.
Gynandropsis 21.—G. affinis 21, pentaphylla 21.
Gypsophila 42.—G. Vaccaria 42.

Hallia hirta 180, monophylla 180, sororia 231, trifoliata 231.
Haloragеæ 337.
Haloragis 338.—H. oligantha 338.
Hamiltonia 423.—H. Mysorensis 423.
Hapalocarpum 305.
Hapalosia 358.—H. Lœflingiæ 358.
Hardwickia 284.—H. binata 284, pinnata 284.
Harpelema 195.
Hartighesia Alliaria 121.
Hartogia 155.
Hedera 376.—H. cheirantha 376, Jatrophifolia 376, latifolia 376, Leschenaultii 377, ovata 377, terebinthacea 377, trifoliata 377.
Hedyoteæ 405.
Hedyotideæ 401.
Hedyotis 439, 405.—H. affinis 411, 416, alata 413, alsinæfolia 415, angustifolia 412, approximata 412, articularis 406, aspera 417, attenuata 416, auriculata 412, biflora 413, 415, brachiata 415, 416, Burmanniana 415, calycina 409, capitata 418, capitellata 405, 408, cephalophora 408, cœrulea 412, congesta 412, corymbosa 408, costata 412, cymosa 418, deltoidea 410, 411, dichotoma 416, diffusa 415, 417, elongata 417, fimbriata 412, fruticosa 408, glabella 418, glabra 412, graminifolia 416, 417, herbacea 416, Heynei 415, 416, hirsuta 412, hispida 412, 413, 418, ingrata 409, Indica 413, intermedia 415, Lawsoniæ 407, Leschenaultiana 411, 450, Leschenaultii 407, 450, Lindleyana 409, linarifolia 418, lineata 412, linifolia 416, macrophylla 408, macrostemon 406, 407, maritima 417, minima 418, mollis 406, monosperma 410, Mysorensis 418, nervosa 412, nitida 412, nodiflora 408, nudicaulis 416, orbiculata 414, paniculata 417, pinifolia 412, polycarpa 406, pruinosa 408, puberula 418, pumila 414, 415, pygmæa 418, repens 405, Rheedei 409, rotundifolia 414, scandens 406, 407, serpyllifolia 405, 414, stipulata 409, stylosa 407, 411, subcarnosa 412, triflora 418, trinervia 414, tubularis 418, ulmifolia 412, umbellata 407, 412, 413, uncinella 408, urophylla 409, verticillaris 409, vestita 412, villosa 450, volubilis 406, 407, Wightiana 410.
Hedysareæ 216, 255.
Hedysarum 198.—H. alatum 225, Alhagi 232, alopecuroides 222, arboreum 224, aureum 237, 239, auriculatum 226, biarticulatum 230, bijugum 218, bupleurifolium 233, 234, capitatum 228, cephalotes 224, ciliatum 220, collinum 225, conicum 228, conjugatum 217, crinitum 222, cuneifolium 198, cylindricum 233, dichotomum 226, diffusum 226, diphyllum 217, erinaceum 198, Gangeticum 225, glumaceum 234, glutinosum 248, gramineum 233, gyrans 227, gyroides 227, hamatum 218, hamosum 222, heterocarpum 228, heterophyllum 229, lagenarium 219, lagopoides 222,

Digitized by Google

latebrosum 180, latifolium 225, 226, lineare 226, lineatum 242, linifolium 199, longifolium 234, maculatum 225, moniliferum 232, Nalla-Kashina 216, Nali-Tali 219, nudum 238, nummularifolium 198, 233, orbiculatum 231, parvifolium 230, pictum 222, pilosum 223, polycarpum 228, procumbens 223, prostratum 199, 209, pulchellum 230, punctatum 239, purpureum 228, quinqueangulatum 226, recurvatum 226, reptans 229, retroflexum 223, rotundifolium 198, rufescens 239, 228, scariosum 234, sennoides 216, siliquosum 228, sororium 231, strobuliferum 243, styracifolium 223, 225, 234, 235, tenellum 230, triflorum 229, triquetrum 225, tuberosum 205, umbellatum 224, vaginale 233, varium 233, venosum 240, vespertilionis 221, viscidum 221, volitans 221.

Heisteria 88.

Helicteres 60.—H. Carthagenensis 60, Isora 60, 448, longifolia 60, macrophylla 60, Roxburghii 60.

Helosciadium 367.—H. Heyneanum 368, trifoliatum 368.

Heptapleurum 377.

Heracleum 372.—H. diversifolium 368, Hookerianum 372, rigens 373, Sprengelianum 372, Wallichii 368.

Heritiera 63.—H. attenuata 63, Fomes 63, littoralis 63, minor 63.

Hermannieæ 65.

Herpetica 287.

Heuchera dichotoma 364.

Heylandia 180.—H. cordifolia 199, hebecarpa 180, latebrosa 180, leiocarpa 180.

Heynea 120.—H. affinis 121, trifolia 120, trijuga 121.

Hibiscus 47.—H. Abelmoschus 53, acerifolius 50, aculeatus 447, bifurcatus 48, Borbonicus 50, canabinus 50, canescens 49, Chitle-Benda 47, circinnatus 52, collinus 51, coriaceus 53, crotonifolius 52, dissectus 48, diversifolius 48, elatus 52, eriocarpus 51, esculentus 53, 448, ficulneus 53, flavescens 53, furcatus 48, 447, Gangeticus 49, Guinensis 52, hirtus 51, 448, Lampas 48, longifolius 53, 448, lunarifolius 49, micranthus 51, morifolius 47, moschatus 53, 448, mutabilis 51, obtusifolius 50, odoratus 47, panduriformis 50, phœniceus 51, pilosus 50, populneoides 54, populneus 54, prostratus 448, pruriens 49, pseudo-Abelmoschus 53, pterospermoides 53, pumilus 448, radiatus 48, rhombifolius 49, rigidus 51, Rosa-Malabarica 51, Rosa-Sinensis 49, septemnervosus 50, setosus 49, 50, sidoides 49, similis 52, sinuatus 53, Solandra 55, 448, Subdariffa 52, Surattensis 48, 447, Syriacus 49, tetralocularis 448, tiliaceus 52, tortuosus 52, tricuspis 52, Trionum 48, truncatus 50, tubulosus 50, unilateralis 51, velutinus 50, vesicarius 48, vitifolius 50, 448, Wightianus 49, Zeylanicus 47, 447.

Hippocratea 103.—H. disperma 104, Indica 104, 448, obtusifolia 104, tortuosa 104, volubilis 104.

Hippocrateaceæ 103.

Hippocrepis barbata 228.

Hiptage 107.—H. Madablota 107, parvifolia 107.

Hiræa 108.—H. cordata 108, Indica 108, nutans 108.

Holigarna 156, 169.—H. longifolia 169, racemosa 169.

Holosteum cordatum 359.

Hopea 85.—H. glabra 85, Wightiana 85.

Hornera 253.

Hosackia Indica 195.

Houstonia 406.

Hugonia 72.—H. ferruginea 72, Mystax 72, obovata 448.

Hugoniaceæ 71.

Humboldtia 284.—H. Brunonis 285, laurifolia 285, tripetala 285.

Hydnocarpus 30.—H. inebrians 30.

Hydrocaryes 335.

Hydrocera 140.—H. angustifolia 141, triflora 140.

Hydrocereæ 140.

Digitized by Google

Hydrocotyle 366.—H. Asiatica 366, Heyneana 366, Nepalensis 366, polycephala 366, rotundifolia 366, tenella 366, Wightiana 366, Zeylanica 366.
Hydrophylax 441.—H. maritima 441.
Hymenodyction 392, 396.—H. excelsum 392, obovatum 392.
Hyperanthera decandra 178, Moringa 178.
Hypericineæ 98.
Hypericum 99.—H. alternifolium 99, Hookerianum 99, humifusum 99, Japonicum 99, Mysurense 99, Nepalense 100, pallens 100, setosum 100, Wightianum 99.
Hyptianthera 399.—H. stricta 399.

Icica 177.—I. dentata 96, Indica 177.
Ilicineæ 155.
Illecebreæ 357.
Illecebrum verticillatum 356.
Impatiens 135.—I. arcuata 136, baccifera 141, Balsamina 135, 136, bulbosa 137, Chinensis 137, coccinea 136, cornuta 136, 137, diversifolia 138, fasciculata 138, 139, 140, filiformis 140, 448, fruticosa 137, grandis 137, heterophylla 138, 139, inconspicua 139, Kleinii 137, 140, latifolia 136, 138, Leschenaultii 136, 138, longifolia 136, lucida 138, Madagascariensis 140, Malabarica 139, Mysorensis 137, 139, 140, natans 140, 141, oppositifolia 137, 138, 139, 140, 448, pendula 136, 140, pusilla 139, reticulata 139, Rheedei 138, rosmarinifolia 139, 140, rufescens 138, 140, scabriuscula 136, 140, scapiflora 137, tenella 140, tomentosa 139, triflora 141, tripetala 135, 138, umbellata 137.
Indigofera 198.—I. adenophylla 201, Anil 202, arborea 203, arcuata 204, argentea 201, 202, armata 204, aspalathifolia 199, aspalathoides 199, atropurpurea 203, barbata 205, brachycarpa 203, cæspitosa 199, canescens 201, 204, cassioides 203, cœrulea 203, colorata 202, congesta 201, cordifolia 199, echinata 198, elliptica 203, enneaphylla 199, flaccida 204, foliosa 192, 202, fragrans 200, frumentacea 199, glabra 200, glandulosa 199, 201, glaucescens 203, glutinosa 200, graveolens 200, hedysaroides 204, heterophylla 200, 201, hirsuta 204, Indica 202, Kleinii 204, Leschenaultii 201, linifolia 198, marginulata 204, multicaulis 201, Mysorensis 202, Orixensis 201, parviflora 201, pauciflora 201, pedicellata 200, 204, pentaphylla 200, peregrina 201, polygonoides 199, polyphylla 202, prostrata 198, 201, 204, pulchella 203, purpurascens 203, pusilla 200, retusa 203, rigida 204, scabra 204, Sumatrana 202, tenuifolia 200, ternata 204, tinctoria 202, trifoliata 201, trita 203, 204, uncinata 203, uniflora 199, verrucosa 203, violacea 203, viscosa 200, Wightii 202.
Ionidum 32.—I. Capense 33, enneaspermum 33, 37, erectum 33, frutescens 33, heterophyllum 33, leptorhizum 33, suffruticosum 32, 33, Wightianum 33.
Inga 268.—I. bigemina 269, concordiana 270, dulcis 268, flexuosa 269, geminata 269, Koenigii 269, lucida 269, nitida 269, umbellata 270, Wightiana 269, xylocarpa 269.
Involucraria 349, 350.—I. Wallichii 350.
Ixora 427, 433.—I. alba 401, 430, arborea 429, arguta 430, attenuata 430, Bhanduca 427, brachiata 429, coccinea 427, corymbosa 430, cuneifolia 427, 428, 429, 430, decipiens 429, elongata 430, flammea 428, grandiflora 427, incarnata 428, lanceolaria 429, 430, leucantha 430, micrantha 429, nigricans 428, Notoniana 428, Nuny-papata 431, obovata 427, paniculata 430, 431, parviflora 429, Pavetta 429, 431, propinqua 427, puberula 430, speciosa 428, stricta 427, 430, tomentosa 431, undulata 428, Wallichii 428, Wightiana 429, 430.

Jackia excelsa 39.
Jambolifera pedunculata 147.
Jambosa 332.—J. alba 332, aquea 332, domestica 332, macrophylla 332, Malaccensis 332, purpurascens 332, purpurea 333, vulgaris 332.

Digitized by Google

Jasminum hirsutum 422.
Johnia 105, 449.—J. Coromandeliana 105, salacioides 105, Wightii 449.
Jonesia 284.—J. Asoca 284, pinnata 284.
Juglans Catappa 313.
Jussiæa 335.—J. angustifolia 336, Blumeana 336, caryophyllæa 336, exaltata 336, fluviatilis 335, fruticosa 336, racemosa 316, repens 335, suffruticosa 336, villosa 336.

Kadsumi 205.
Kalanchoe 359.—K. floribunda 359, grandiflora 359, heterophylla 360, laciniata 360, spathulata 360, Wightiana 359.
Kallstrœmia 145.
Kandelia 310.—K. Rheedei 311.
Kanneli-Itti-Kanni 387.
Ketmia 48.
Kleinhovia 64.—K. Hospita 64.
Kleinhovieæ 64.
Knoxia 439.—K. corymbosa 439, 440, exserta 439, glabra 412, Heyneana 439, 440, mollis 439, stricta 440, Sumatrensis 439, teres 439, umbellata 439, umbellifera 440, Wightiana 439, 440, Zeylanica 440.
Kohautia 417.
Koon 114.
Kydia 69.—K. calycina 70, fraterna 70, pulverulenta 70.

Lablab 250.—L. cultratus 251, leucocarpus 251, lignosus 250, microcarpus 251, Nankinicus 250, perennis 251, vulgaris 250.
Lacuris illicioides 148.
Lagenaria 341.—L. vulgaris 341.
Lagerstrœmia 308.—L. flos-Reginæ 308, hirsuta 308, Indica 308, lanceolata 309, parviflora 308, 309, Reginæ 308, 309.
Lagerstrœmieæ 308.
Laguncularia 449.—L. purpurea 449, rosea 449.
Lagunea 55.—L. aculeata 53, 55, lobata 55.
Lahaya corymbosa 357, spadicea 358.
Langsdorfia 148.
Lansium 119.
Larbrea aquatica 42.
Lathyrus Aphaca 235, sativus 235.
Lawsonia 307.—L. alba 307, falcata 307, inermis 307, purpurea 406, spinosa 307.
Lebretonia 47.—L. flava 47, procumbens 47.
Lechea verticillata 41.
Leea 131.—L. æquata 132, arborea 132, integrifolia 132, Ottilis 132, robusta 132, sambucina 132, staphylea 132.
Leguminosa ..... 203, indeterminata 262.
Leguminosæ 178.
Lentago 388.
Lepidium sativum 19.
Leptospermum Amboinense 37.
Lespedeza 231.—L. Indica 231, juncea 199, lagopoides 222, lineata 243.
Ligusticum Ajowan 368, Indicum 371.
Limo ferus 98, taurinus 98, tuberosus 98, unguentarius 98, ventricosus 98.
Limonia 90, 91.—L. acidissima 92, alata 92, arborea 92, bilocularis 94, citrifolia 92, crenulata 92, diacantha 91, minuta 448, Missionis 92, monophylla 91, pentagyna 92, pentaphylla 93, pubescens 448, trifoliata 91, 448.
Lineæ 134.
Linearum familiæ 362.

Digitized by Google

Linum 134.—L. Mysurense 134, repens 134, trigynum 134, usitatissimum 134.
Lobocarpus 7.—L. Candolleanus 7.
Loeflingia Indica 358.
Lonicera 381, 389.—L. Leschenaultii 389, ligustrina 389, mollis 389, Zeylanica 384.
Loniceræ 389.
Loranthaceæ 378.
Loranthus 379, 381.—L. amplexicaulis 385, amplexifolius 384, bicolor 384, biflorus 386, bracteatus 385, buddleioides 383, 386, Candolleanus 385, capitellatus 382, cordifolius 383, coriaceus 382, cuneatus 385, elasticus 386, falcatus 384, globosus 387, goodeniiflorus 385, Heyneanus 383, 385, Heynei 383, Hookerianus 381, 386, Kanneli 387, Koenigianus 384, lobeliiflorus 385, longiflorus 384, loniceroides 382, mimecylifolius 383, Mitchellii 387, montanus 385, Neelgherrensis 382, obtusatus 381, polystachyus 381, recurvatus 383, rugulosus 386, sarcophyllus 384, Scurrula 383, terrestris 381, tetrandrus 381, tomentosus 383, 385, trigonus 386, turbinatus 386, umbellatus 382, viscifolius 385, Wallichianus 381, Wightianus 384.
Loteæ 180.
Lotus Indicus 195.
Lourea 221.—L. Vespertilionis 221.
Ludwigia 336.—L. diffusa 336, jussiæoides 336, oppositifolia 336, parviflora 336, perennis 336, Zeylanica 336.
Luffa 343.—L. acutangula 343, amara 343, 344, Cattu-picinna 343, echinata 343, Kleinii 344, pentandra 343, Petola 343, Plukenetiana 343, tuberosa 344.
Lumnitzera 316, 424.—L. coccinea 316, 449, racemosa 316. 424, 449.
Lunanea 62.
Lunu-Ankænda 148.
Lupinus Cochinchensis 187, trifoliatus 192, 197.
Luvunga 90.
Lycium fœtidum 441, Indicum 441, Japonicum 441.
Lythrarieæ 302.
Lythreæ 303.
Lythrum fruticosum 308, Pemphis 307, triflorum 307.

Macrandria 406.
Macqueria 148.
Macrocnemum strictum 399.
Macrotyloma 248.
Magnoliaceæ 6.
Magnolieæ 6.
Mahonia Nepalensis 16.
Mallea 118.—M. Rothii 118.
Malpighiaceæ 116.
Malva 45.—M. Mauritiana 45, rosea 45, rotundifolia 45.
Malvaceæ 45.
Malvaviscus populneus 54.
Mammea Asiatica 333.
Mangifera 169.—M. axillaris 169, domestica 170, Indica 170, montana 170, oppositifolia 156, 170, pinnata 170, 173.
Mangostana Cambogia 100.
Manna hebraica 232.
Marsana buxifolia 94.
Medicago esculenta 196.
Medinilla 324.
Melaleuca 326.—M. bicolor 319, Cajaputi 326, 327, leucadendron 326, minor 326.

Digitized by Google

Melanium fruticosum 307.
Melanoxylon Cadika-marum 313.
Melastoma 324.—M. asperum 323, glomerata 323, Malabathricum 324, polyanthum 324.
Melhania 68.—M. Burchellii 68, incana 68.
Melia 117.—M. Azadirachta 118, Azedarach 117, baccifera 118, composita 117, Koetjape 120, robusta 117, sempervirens 117, suberba 117.
Meliacea Wightiana 119.
Meliaceæ 116, 448.
Melianthus major 144.
Melicocca trijuga 114.
Melieæ 116.
Melilotus 196.—M. altissima 196, Indica 196, leucantha 196, minima 196, parviflora 196, vulgaris 196.
Melochia concatenata 66, corchorifolia 66, supina 66, truncata 66.
Melothria Zeylanica 129.
Memecyleæ 318.
Memecylon 319, 387.—M. amplexicaule 320, capitellatum 319, cordatum 320, depressum 320, edule 319, grande 320, Heyneanum 319, laxiflorum 319, ovatum 319, pyriforme 320, ramiflorum 319, 320, sessile 320, tinctorium 319, umbellatum 319.
Menispermaceæ 11, 161.
Menispermeæ 11.
Menispermum acuminatum 12, coccineum 12, Cocculus 12, 446, cordifolium 12, flavescens 12, glabrum 12, heteroclitum 446, hirsutum 13, 446, lacunosum 12, Malabaricum 12, myosotoides 13, orbiculatum 12, peltatum 14, polycarpum 12, radiatum 12, verrucosum 12, villosum 13.
Mephitidia Roxburghii 390, Wallichii 390.
Mespilus Japonica 302.
Mesua 102.—M. ferrea 102, speciosa 102.
Meteorus coccineus 333.
Metrosideros saligna 327.
Mezoneurum 282.—M. cucullatum 281, 283.
Michelia 6.—M. Champaca 6, 446.
Microchlæna 70.—M. quinquelocularis 71.
Microcos mala 81, paniculata 81, Stauntoniana 81.
Micromelum 90.—M. minutum 448, pubescens 94.
Miliusa 10.—M. Indica 10.
Millettia 263.—M. rubiginosa 263, splendens 263.
Millingtonia 115.—M. pungens 115, semialata 241, simplicifolia 115, stricta 241.
Millingtoniaceæ 115.
Milnea 116, 118.—M. montana 116, 118, Roxburghiana 119.
Mimosa 268.—M. abstergens 278, alba 277, amara 274, Arabica 277, armata 268, bigemina 269, 270, biglobosa 279, cæsia 278, Catechu 272, 273, Catechuoides 272, 273, cinerea 271, concinna 277, Concordiana 270, cornigera 273, 274, dulcis 269, dumosa 274, eburnea 276, Entada 268, Farnesiana 272, ferruginea 273, 277, flexuosa 275, geminata 269, grandiflora 279, hamata 268, horrida 276, Indica 272, Intsia 278, Kleinii 276, latronum 273, 274, Lebbek 275, leucophlæa 277, lucida 269, 270, marginata 275, natans 270, nitida 269, octandra 268, odoratissima 275, pedunculata 279, pennata 277, 278, planifrons 276, procera 275, prostrata 270, pudica 220, pulchella 275, Rottleri 268, rubicaulis 268, rugata 277, saponaria 278, scandens 268, sensitiva 220, sepiaria 272, Sirissa 275, Smithiana 274, speciosa 275, spinosiliqua 268, stipulacea 274, stipulata 274, Suma 273, Sundra 273, tenuifolia 278, tomentosa 274, 276, torta 277, triquetra 270, umbellata 270, umbrifera 276, virgata 270, xylocarpa 269.
Mimoseæ 267.

Digitized by Google

Mischocarpus 113.
Modecca 353.—M. bracteata 350, 353, diversifolia 353, 448, integrifolia 353, palmata 353, tuberosa 353, Wightiana 353.
Molina racemosa 107.
Molinæa 113.—M. canescens 113.
Mollia corymbosa 357, spadicea 357.
Mollugo 43.—M. bellidifolia 43, Cerviana 44, disticha 44, erecta 44, Linkii 44, nudicaulis 43, paniculata 44, parviflora 44, pentaphylla 44, radiata 44, Spergula 44, stricta 44, triphylla 44, verticillata 44.
Momordica 348.—M. balsamina 348, Charantia 348, Cochinchensis 349, dioica 348, Heyneana 349, humilis 349, Missionis 348, mixta 349, monadelpha 347, muricata 348, sativa 341, spicata 348, tubiflora 348, umbellata 346.
Monocera 83.—M. tuberculata 83.
Morinda 418.—M. angustifolia 420, aspera 420, bracteata 419, 420, Chachuca 420, citrifolia 419, exserta 419, Mudia 420, Padavara 420, parvifolia 421, scandens 420, stenophylla 420, tetrandra 421, tinctoria 419, tomentosa 420, umbellata 420, 421.
Morindeæ 418.
Moringa 178.—M. oleifera 178, polygona 178, pterygosperma 178, Zeylanica 178.
Moringeæ 177.
Mougeotia corchorifolia 66.
Moulinsia cupanioides 112, rubiginosa 112.
Mouriria 319.
Mucuna 253.—M. atropurpurea 254, capitata 255, gigantea 254, hirsuta 254, monosperma 254, nivea 255, pruriens 255, prurita 255.
Mundulea 210.
Muricia Cochinchensis 349.
Murraya 90, 94.—M. exotica 94, longifolia 94, paniculata 94, 95, Sumatrana 95.
Mussænda 393.—M. arcuata 393, Belilla 394, corymbosa 393, Dovinia 394, flavescens 394, frondosa 393, 394, glabra 393, Landia 394, tomentosa 394.
Myginda 155.—M. ilicifolia 155, myrsinoides 155, myrtifolia 155.
Myonima multiflora 330.
Myrcia acris 331, pimentoides 331.
Myricaria vaginata 40.
Myrtaceæ 326.
Myrtus 328.—M. acris 331, Androsæmoides 350, aromatica 331, 332, bracteata 331, canescens 328, caryophyllata 329, 331, citrifolia 332, Coromandeliana 331, Cumini 329, cuneata 332, Heynei 331, Jambos 332, latifolia 331, littoralis 331, macrophylla 333, Malaccensis 333, Pimenta *var.* latifolia 331, ruscifolia 331, Sonneratii 330, tomentosa 328, Willdenowii 331, Zeylanica 330.
Myriophyllum 338.—M. Indicum 310, 339, tetrandrum 339.
Myrobalanus 313.—M. Bellirica 313, Chebula 313, 314.

Naravelia 2.—N. Zeylanica 2.
Naregamia 116.—N. alata 117.
Nasturtium 19.—N. divaricatum 19, diversifolium 19, Gangeticum 19, heterophyllum 19, Madagascariense 19, micranthum 19, montanum 19.
Natsiatum herpeticum 161.
Naucleа 390.—N. Cadamba 392, cordifolia 391, Missionis 392, orientalis 391, 392, parviflora 391, parvifolia 391, purpurea 391, 449, 450, rotundifolia 449, sterculiæfolia 449.
Naucleæ 390.
Neerija 156.—N. dichotoma 157.
Negretia 253.

Digitized by Google

Nela-Naregam 117.
Nelumbium 16.—N. speciosum 16.
Nelumbo nucifera 16.
Nemedra elæagnoidea 119.
Nephelium 113.—N. Benghalense 113, lappaceum 113, Litchi 113, Longanum 113, rimosum 113.
Neptunia 270.—N. oleracea 270.
Nesæa 304, 307.—N. triflora 307.
Nhandirobeæ 340.
Nicolsonia styracifolia 223.
Niebuhria 23.—N. arenaria 24, linearis 23, oblongifolia 23.
Niota 63.—N. Lamarckiana 151, lucida 151, polyandra 63, tetrapetala 151.
Nomismia 236, 238.—N. aurea 237, capitata 237, Nummularia 237.
Nonatelia hispida 390.
Notonia 207, 449.—N. Wightii 208, 449.
Nyctanthes hirsuta 422.
Nymphæa 16.—N. Cachlara 446, edulis 447, esculenta 447, Lotus 17, 447, Nelumbo 16, Nouchali 17, pubescens 17, rubra 17, 447, stellata 17.
Nymphæaceæ 16.

Ochna 152.—O. Heyneana 152, lucida 152, nana 152, nitida 152, obtusata 152, parvifolia 152, squarrosa 152, Wightiana 152.
Ochnaceæ 151.
Odina 171.—O. Wodier 171.
Odonia trinerva 257.
Olacineæ 88.
Olax 88.—O. Bador 88, Heyneana 89, imbricata 89, lucida 89, obtusa 89, Psittacorum 89, scandens 89, Wightiana 89, Zeylanica 88.
Oldenlandia 413.—O. affinis 416, alata 414, aspera 417, Asperulæ 416, biflora 364, 413, 414, 415, 417, capillaris 416, 417, corymbosa 408, crystallina 415, decumbens 364, depressa 414, dichotoma 364, 416, 417, diffusa 415, digyna 364, graminifolia 417, herbacea 416, linearifolia 416, 417, linifolia 416, maritima 414, nudicaulis 416, paniculata 413, 414, pauciflora 415, pentandra 364, pusilla 416, racemosa 414, radicans 413, ramosa 414, repens 405, 414, scabra 418, sessiliflora 364, stricta 417, tenuifolia 415, 417, trinervia 414, umbellata 413.
Olea serrata 83.
Omphalobium Indicum 143, pinnatum 143.
Onagrariæ 335, 364.
Onobrychis cuneifolia 198, lineata 243, rotundifolia 198, sororia 231.
Ophiorhiza 404.—O. bracteolata 405, Brunonis 404, Harrisiana 405, Munghos 404, 405, rugosa 405.
Ophioxylon arboreum 434.
Opuntia 363.—O. Dillenii 363.
Ormocarpum 216.—O. cassioides 216, sennoides 216, sulcatum 216, verrucosum 216.
Ornitrophe 109.—O. Aporetica 110, Cobbe 110, glabra 110, serrata 110.
Osbeckia 322.—O. aspera 323, capitata 323, cupularis 323, glauca 323, inappendiculata 323, Kleinii 323, Leschenaultiana 322, truncata 322, virgata 323, Wightiana 322, 323, Zeylanica 322.
Ottilis Zeylanica 132.
Oxalideæ 141.
Oxalis 142.—O. caprina 142, corniculata 142, monadelpha 142, pusilla 142, repens 142, sensitiva 142, stricta 142.
Oxycarpus Gangetica 101, Indica 101.
Ozodia 375.—O. fœniculacea 375.

Pachyrhizus 251.—P. angulatus 251.

Digitized by Google

Padavara 420.
Pæderia 424.—P. erecta 424, fœtida 424, recurva 424, ternata 424, Valli-Kara 424.
Panax 376.—P. Anisum 376, fruticosum 376, Heyneana 376, Leschenaultii 377.
Papaver 17.—P. somniferum 17.
Papaveraceæ 17.
Papayaceæ 351.
Papaya vulgaris 352.
Papilionaceæ 178.
Paratropia 377.—P. capitata 377, nodosa 377, venulosa 377, Wallichiana 377.
Paritium 52.—P. Gangeticum 49, tiliaceum 52, tricuspis 52.
Parkia 279.—P. biglandulosa 279, Brunonis 279, Roxburghii 279.
Parkieæ 279.
Parkinsonia 283.—P. aculeata 284.
Parnassia 34.—P. fimbriata 35, Kotzebuei 35, Mysorensis 35, ornata 35, pusilla 35, Wightiana 35.
Parnassieæ 34.
Parochetus 251.—P. major 252.
Paronychiaceæ 357.
Passiflora 352.—P. Heyneana 353, Leschenaultii 352.
Passifloreæ 352.
Pastinaca 372.—P. Candolleana 372, ligusticifolia 372.
Pauletia 295.
Paullinia Asiatica 149.
Pavetta 430, 433.—P. alba 431, amplexicaulis 430, angustifolia 430, barbata 430, breviflora 429, Brunonis 431, hispidula 431, Indica 430, 431, lucens 431, polyantha 431, Rothiana 431, Sumatrensis 430, tomentosa 431, velutina 431, villosa 431, Wightiana 401, 430.
Pavonia 47.—P. odorata 47, repanda 46, sidoides 47, Zeylanica 47.
Peganum 146.—P. Harmala 146.
Pegia 171.
Pelargonium glomeratum 133, Radula 133, Zonale 133.
Pemphis 306.—P. acidula 307, angustifolia 307.
Pentapetes 67.—P. acerifolia 69, angustifolia 67, phœnicea 67, suberifolia 69.
Pentaptera 314.—P. angustifolia 314, Arjuna 314, coriacea 315, crenulata 314, cuneata 314, glabra 314, paniculata 315, tomentosa 314.
Peplidium cochlearifolium 414.
Peplis Indica 303, Portula 405.
Peripetalæ 155.
Perrottetia 155.
Petaloma 316.—P. alternifolia 316.
Peucedaneæ 371.
Phanera 298.
Pharnaceum Cerviana 44, depressum 358, distichum 44, Molugo 44, parviflorum 44, pentagonum 362, pentaphyllum 44, spathulatum 43, strictum 44, triphyllum 44.
Phaseoleæ 236, 255.
Phaseolus 243.—P. aconitifolius 246, 247, alatus 244, amarus 244, calcaratus 245, Caracalla 244, compressa 243, difformis 250, farinosus 245, Grahamianus 244, Hernandesii 245, hirtus 245, lobatus 247, lunatus 244, Max 244, Minoomoo 246, multiflorus 244, Mungo 245, 246, nanus 243, psoraleoides 244, radiatus 246, Romanus 243, rostratus 244, Roxburghii 246, saponaceus 243, semierectus 244, trilobus 246, 247, trinervius 245, vulgaris 243, 244, Wightii 245.
Phellandrium 369.
Phoberos 29.—P. Chinensis 30, crenatus 29, 30, lanceolatus 30, macrophyllus 30, Wightianus 30.
Photinia 302.—P. Lindleyana 302, Notoniana 302.

Digitized by Google

Phyllodium pulchellum 230.
Phyllomatia 239.
Physocalycium 360.
Physotemon 22.
Phytocrene 161.
Pietetia ternata 216.
Pimpinella 368.—P. Candolleana 369, diversifolia 368, Heyneana 368, involucrata 369, Javana 369, Leschenaultii 369, trifoliata 368.
Pisum sativum 235.
Pittosporeæ 153, 158.
Pittosporum 153, 154.—P. floribundum 154, Neelgherrense 154, tetraspermum 154, viridiflorum 154.
Plagiotaxis Chickrassa 123, grandiflora 123, velutina 123.
Platynema 107.—P. laurifolium 107.
Pleurostylia 157.—P. Heynei 157, Wightii 157.
Podalyria aurea 179.
Poinciana 282.—P. compressa 282, elata 282, insignis 282, pulcherrima 282.
Poivrea 317.—P. pilosa 317, Roxburghii 317.
Polanisia 22.—P. Chelidonii 22, dodecandra 22, felina 22, graveolens 22, heterophylla 23, icosandra 22, Leschenaultii 22, viscosa 22.
Polia 357.—P. arenaria 357.
Polycarpæa 357.—P. Benthamii 358, corymbosa 358, densiflora 357, 358, depressa 358, Indica 358, lanuginosa 358, Memphitica 358, spadicea 357, 358, subulata 358.
Polycarpon pusillum 358.
Polygala 36.—P. angustifolia 37, arillata 39, arvensis 33, 36, 37, 38, brachystachya 37, Ceylana 39, Chinensis 36, ciliata 38, crotalloides 36, elongata 38, glaucoides 36, 37, grandiflora 36, Heyneana 38, Javana 38, linarifolia 38, linearis 38, persicariæfolia 39, procumbens 36, 37, prostrata 36, 38, ramosa 38, rosmarinifolia 37, Rothiana 37, serpyllifolia 36, 37, telephioides 36, thesioides 33 tomentosa 37, Tranquebarica 37, triflora 37, Vahliana 36, Wightiana 38.
Polygaleæ 35.
Polyozus 431.—P. maderaspanata 401.
Pomaceæ 301.
Pomaderris capsularis 166.
Pongamia 262.—P. elongata 263, glabra 262, grandiflora 263, Heyneana 263, ovalifolia 262, racemosa 211, religiosa 262, sericea 263, triphylla 262, uliginosa 262, 263.
Portulaca 355.—P. cristata 356, meridiana 356, oleracea 356, quadrifida 356, repens 356, suffruticosa 356, tuberosa 356, Wightiana 356.
Portulaceæ 354.
Posoqueria dumetorum 397, floribunda 398, fragrans 400, longispina 398, nutans 397, uliginosa 398.
Potentilla 300.—P. alpestris 300, Grahamiana 301, Heynei 300, Kleiniana 300, Leschenaultiana 301, opaca 300, supina 300, verna 300, Wallichiana 300.
Potentilleæ 298.
Poupartia Mangifera 173.
Priotropis cytisoides 180.
Prosopis 271.—P. spicata 272, spicigera 271, 278.
Protium 176.—P. caudatum 176, Gileadense 177, pubescens 176, Roxburghiana 176.
Pseudaleia 88.
Pseudarthria 209.—P. Hookeri 209, viscida 209.
Pseudocynometra 294.
Psidium 328.—P. angustifolium 328, caninum 328, Cujavillus 328, pomiferum 328, pumilum 328, pyriferum 328.

Digitized by Google

Psophocarpus 252.—P. tetragonolobus 252.
Psoralea 197.—P. corylifolia 198, tetragonoloba 197.
Psychotria 432.—P. ambigua 433, bisulcata 434, bracteata 434, connata 433, curviflora 433, herbacea 436, lævigata 433, nudiflora 434, ophioxyloides 433, Reevesii 432, sphærocarpa 433, truncata 433, vaginans 434, volubilis 424.
Psydrax 426.—P. dicoccos 401, 425.
Ptelea viscosa 114.
Pternadra 324.—P. capitellata 235.
Pterocarpus 266.—P. bilobus 267, dalbergioides 267, Marsupium 266, santalinus 266, Sissoo 264, uliginosa 262, Wallichii 267.
Pterolobium 283.—P. lacerans 283.
Pterospermum 68.—P. acerifolium 69, aceroides 448, canescens 68, glabrescens 69, Heyneanum 69, reticulatum 69, rubiginosum 68, suberifolium 68, 69.
Ptychocentrum 239.
Ptychotis 368.—P. Ajowan 368, Roxburghiana 369.
Pueraria 205.—P. tuberosa 205, 449.
Punica 327.—P. Granatum 327.
Putoriæ 440.
Pycnospora 197.—P. hedysaroides 197, nervosa 197, 449.
Pyrostria 422.
Pyrrhanthus albus 316, littoreus 316.
Pyrrhotrichia 238.—P. tuberosa 238.

Quinaria Lansium 95.
Quisqualis 318.—Q. densiflora 318, glabra 318, Indica 318, Loureiri 318, pubescens 318, villosa 318.

Randia 399, 401.—R. corymbosa 399, dumetorum 397, fasciculata 397, floribunda 397, 398, foliolosa 398, horrida 397, longiflora 397, longispina 397, 398, Malabarica 400, nutans 397, rigida 397, Rottleri 397, sinensis 397, stricta 399, tomentosa 398, uliginosa 398.
Ranunculaceæ 1.
Ranunculineæ 1.
Ranunculus 3.—R. acris 4, reniformis 3, subpinnatus 4, Wallichianus 4.
Raphanus sativus 19.
Ratonia 113.
Reichardia decapetala 282, hexapetala 283.
Reinaria 211.
Reseda 28.—R. alba 28, undata 28.
Resedaceæ 28,
Retinaria 166.—R. scandens 167.
Rhamneæ 161.
Rhamnus 164.—R. catharticus 165, circumscissus 165, filiformis 164, glabratus 162, hirsutus 165, Jujuba 162, lucidus 165, myrtinus 165, Napeca 162, 163, Neerija 157, Œnoplia 163, parviflorus 164, virgatus 165, Wightii 164, Xylopyrus 162.
Rhetsa 148.
Rhizophora 310.—R. Candel 311, Candelaria 310, caryophylloides 311, caseolaris 327, cylindrica 311, decandra 311, gymnorhiza 311, Mangle 310, parviflora 311, sexangula 311, Timoriensis 311.
Rhizophoreæ 310.
Rhus 172.—R. Cobbe 110, decipiens 172, Indicum 172, Mysurensis 172, parviflorum 172, Rædælijavel, 143.
Rhynchosia 237, 255.—R. aurea 237, biflora 256, cana 240, capitata 237, crotalarioides 241, densiflora 239, elongata 237, ervoidea 239, Heynei 240, medicaginea 238, 256, microphylla 239, nuda 238, 239, Nummularia 237,

Digitized by Google

pilosa 209, rhombifolia 239, scarabæoides 256, rufescens 239, 240, suaveolens 240, tenuicaulis 239, velutina 238, 257, virgata 238, viscida 209, Wightiana 257.
Riedleia 65.—R. concatenata 66, corchorifolia 66, radiata 66, supina 66, truncata 66.
Robergia hirsuta 144.
Robinia 263.—R. candida 210, filiformis, 206, Heynei 179, Javanica 239, racemosa 211, sennoides 210, subdecandra 179, suberosa 210, uliginosa 262.
Roioc 419.
Rondeletia 402.—R. Asiatica 401, cinerea 402, corymbosa 404, cymosa 425, exserta 402, Heynei 402, Oryssensis 402, paniculata 402, proxima 402, spicata 404, stricta 399, thrysiflora 402, tinctoria 402.
Rondeletieæ 402.
Rosa 301.—R. Leschenaultiana 301, sempervirens 301, Wallichii 301.
Rosaceæ 298.
Roseæ 301.
Rotala 303.—R. decussata 303, Mexicana 303, verticillaris 303.
Rothia 195.—R. trifoliata 195.
Roumea inermis 29.
Rourea 143, 262.—R. santaloides 144.
Roxburghia baccata 89.
Rubentia 156.
Rubia 442.—R. cordifolia 442, Javana 442, Munjista 442, Munjith 442, secunda 442.
Rubiaceæ 390.
Rubus 298—R. albescens 299, Alcesæfolius 299, Goureephul 298, Hamiltonianus 299, hexagynus 299, hirtus 298, Indicus 299, lasiocarpus 299, Moluccanus 299, Mysurensis 299, paniculatus 299, parvifolius 299, racemosus 299, reflexus 299, rotundifolius 299, Roxburghianus 299, rugosus 299, Wallichianus 298.
Rulingia 65.
Rumphia 173.
Russelia oldenlandioides 449, viscosa 449.
Ruta 146.—R. angustifolia 146, Chalepensis 146, graveolens 146.
Rutaceæ 145.

Sabdariffa 52.
Sageretia 163.—S. filiformis 164, oppositifolia 163, 164, parviflora 164, theezans 163.
Sagina ammannoides 447.
Salacia 104.—S. Brunoniana 105, campestris 104, Chinensis 104, 105, Cochinensis 105, fruticosa 106, 448, lævigata 104, oblonga 106, oppositifolia 106, pomifera 105, prinoides 105, Roxburghii 105, Wightiana 105.
Salicarieæ 302.
Salomonia ciliata 38.
Samadera 151, 166.—S. Indica 151.
Sambuceæ 387.
Sambucus 387.—S. Canadensis 449, Wightiana 388.
Sandoricum 119.—S. Indicum 120.
Sanicula 367.—S. elata 367, hermaphrodita 367.
Saniculeæ 367.
Santia 422.—S. venulosa 422.
Sapindaceæ 108.
Sapindeæ 108.
Sapindus 110.—S. abstergens 111, acutus 111, alternifolius 112, Benghalensis 113, deficiens 111, detergens 111, emarginatus 111, fraxinifolius 112, fruticosus 111, laurifolius 111, longifolius 111, microcarpus 112, obova-

Digitized by Google

tus 111, Rarak 111, rubiginosus 112, squamosus 112, tetraphyllus 113, trifoliatus 111.
Saponaria perfoliata 42, 447, Vaccaria 42.
Saraca 284.—S. arborescens 284, Indica 284.
Sarissus 441.—S. anceps 441.
Saul Jallarea 84, Tumbugaia 34.
Saxifragaceæ 363.
Saxifrageæ 364.
Scabiosa Brunoniana 445.
Scandicineæ 375.
Schinus Benghalensis 177, Niara 177, Saheria 177.
Schleichera 114.—S. pentapetala 113, pubescens 114, trijuga 114.
Schmidelia 109.—S. Cobbe 109, distachya 110, racemosa 110, serrata 110.
Schœpfia 378.
Schrebera 156.
Scleromitrion 412.
Sclerostylis 90, 93.—S. atalantioides 93.
Scopolia aculeata 149.
Scutia 165, 319.—S. Commersonii 165, Indica 165, paniculata 158.
Scytalia 113.—S. Longan 113, rimosa 113.
Selas lanceolatum 147.
Sellowia uliginosa 306.
Semecarpus 168.—S. Anacardium 168, cuneifolium 168.
Senacia 154.
Senna 287.—S. Absus 291, alata 287, arborescens 289, auriculata 290, bicapsularis 286, dimidiata 293, esculenta 287, obtusa 288, occidentalis 290, officinalis 288, prostrata 292, purpurea 287, sensitiva 292, Sophera 287, speciosa 289, Sumatrana 289, tenella 292, Tora 291, Toroides 291.
Serissa 440.—S. fœtida 431.
Serpicula 337, 338.—S. brevipes 338, hirsuta 338, veronicæfolia 338.
Sesbania 214.—S. aculeata 214, Ægyptiaca 214, affinis 215, cannabina 215, coccinea 216, Cochinchensis 215, grandiflora 215, procumbens 215.
Seseli 371.—S. Indicum 371, Zeylanicum 368.
Seselineæ 370.
Sesuvium 354, 361.—S. Portulacastrum 361, repens 361.
Sethia 106.—S. Indica 106.
Shorea 84.—S. laccifera 84, robusta 84, Roxburghii 84, Talura 84, Tumbugaia 84.
Shuteria 207.—S. glabrata 207, vestita 207.
Sicyos Garcini 344.
Sida 57.—S. acuta 57, alba 58, alnifolia 58, Asiatica 56, Balbisiana 57, Beloere 56, brachypetala 57, Chinensis 58, cordifolia 58, crispa 56, cuneifolia 66, diversifolia 55, Eteromischos 56, glandulosa 58, glutinosa 59, graveolens 56, heterophylla 55, hirta 56, 59, humilis 59, Indica 56, lanceolata 57, 448, montana 56, multicaulis 59, Mysorensis 59, nervosa 59, olens 59, orientalis 57, periplocifolia 55, Persica 55, Philippica 58, pilosa 56, 59, polyandra 55, populifolia 56, radicans 59, repanda 57, retusa 58, 66, rhombifolia 58, rhomboidea 57, 58, rotundifolia 58, scabrida 57, scoparia 57, spinosa 58, Stauntoniana 57, stipulata 57, tenax 59, tomentosa 56, 57, unilocularis 59, urens 59, urticæfolia 59, veronicæfolia 69, verticillata 59, vesicaria 56.
Silene 42.—S. Indica 42, intrusa 42, noctiflora 42.
Simarubeæ 150.
Sinapis 20.—S. brassicata 19, dichotoma 19, erysimoides 447, glauca 19, juncea 19, 20, lævigata 19, nigra 447, pusilla 447, rugosa 19.
Sison Ammi 365.
Sisymbrium micranthum 19.
Smithia 220.—S. aspera 219, blanda 221, conferta 220, cristata 218, gemini-

Digitized by Google

flora 220, Martinicensis 220, pumila 220, racemosa 221, sensitiva 220, spicata 220,
Soja 247.—S. hispida 247, Japonica 247, Javanica 208, Wightii 208.
Solandra lobata 55.
Solea enneasperma 33, erecta 33.
Solenocarpus 171.—S. Indica 171, 173.
Solenotinus 388.
Sonerila 321.—S. Brunonis 321, grandiflora 322, maculata 321, Rheedei 321, Rottleri 321, Zeylanica 322.
Sonneratia 327.—S. acida 327, apetala 327.
Sophora 179.—S. glauca 179, occidentalis 179, tomentosa 179.
Sophoreæ 179.
Sorindeja 170, 173.—S. Madagascariensis 170.
Soymida 122.—S. febrifuga 122.
Spergula æstivosa 41.
Spermacoce 406, 438.—S. articularis 438, compressa 410, corymbosa 439, 440, exserta 439, glabra 412, hirta 438, 439, hispida 438, 439, lasiocarpa 437, longicaulis 438, ocymoides 437, 439, ramosa 438, ramosissima 438, Roxburghiana 437, scabra 438, stricta 437, Sumatrensis 439, tenera 439, teres 439, tubularis 439, verticillata 437.
Spermacoceæ 436.
Spermadyction 423.
Sphæridiophorum 199.
Sphærosacme laxa 119, polystachya 119, Rohituka 119, spicata 119.
Spondias 172.—S. acuminata 173, amara 173, dulcis 170, 173, lutea 173, Mangifera 173, paniculata 173, purpurea 173, simplicifolia 169.
Spondieæ 167, 172.
Stadmannia 113.—S. trijuga 114.
Stalagmitis cambogioides 100, 102, Cowa 101, ovalifolius 102, pictorius 102.
Staphylea Indica 132, montana 160, vepretum 160.
Staphyleaceæ, 155.
Stellaria 42.—S. aquatica 42, cordata 359, media 42, monogyna 42, uliginosa 42.
Stellatæ 141.
Sterculia 62.—S. acuminata 62, argentea 63, Balanghas 62, Candollei 62, colorata 63, fœtida 63, guttata 62, macrocarpa 62, macrophylla 62, populifolia 62, urens 63, villosa 63.
Sterculieæ 62.
Stigmarota Africana 29, Jangomas 29.
Stizolobium 253, 254.—S. bulbosum 251, giganteum 254, pruriens 255, scarabæoides 256.
Stravadium album 333, coccineum 333, rubrum 333.
Strœmia tetrandra 24, trifoliata 24, 447.
Strophostyles 245.
Stylocoryne 400, 401, 431.—S. Malabarica 400, monosperma 401, Pandaki 400, Webera 401, 430.
Stylosanthus 218.—S. mucronata 218.
Suriana 361.—S. maritima 361.
Surianeæ 360.
Sutherlandia frutescens 209.
Swietenia Chickrassa 123, chloroxylon 123, febrifuga 122, rubra 122.
Swieteniеæ 122.
Symphyopoda 296.
Syzygium 329.—S. Belluta 330, caryophyllæum 329, caryophyllifolium 329, densiflorum 329, fruticosum 330, Heyneanum 330, inophyllum 329, Jambolanum 147, 329, 330, lanceolatum 330, lineare 330, rubicundum 330, salicifolium 330, spicatum 330, Wightianum 330, Zeylanicum 330.

Digitized by Google

Talinum 356.—T. cuneifolium 357, Indicum 356.
Tamara alba 446, rubra 446.
Tamarindus 285.—T. Indica 285, occidentalis 285, orientalis 285.
Tamariscineæ 39.
Tamarix 40.—T. articulata 40, dioica 40, 447, epacroides 40, ericoides 40, Gallica 40, Indica 40, 447, mucronata 40, Pharos 40, tenacissima 40.
Tarenna 401.—T. Zeylanica 401.
Tephrosia 209.—T. argentea 210, 212, biflora 212, brachystachya 211, candida 210, coccinea 211, Colutea 212, diffusa 213, fusca 210, galegioides 213, Grahamii 211, Heyneana 211, Hookeriana 212, hypargyrea 211, incana 212, intermedia 211, lanceæfolia 213, lanceolata 213, lobata 213, maxima 213, Mitchelii 214, nervosa 211, parviflora 213, pentaphylla 213, pulchra 210, purpurea 213, 214, racemosa 210, senticosa 211, sericea 210, spinosa 214, stricta 213, suberosa 210, subsessilis 214, Taylorii 213, tinctoria 211, 213, uliginosa 262, villosa 212, 213, Wallichii 213.
Teramnus labialis 208, parviflorus 208, tenuiflorus 206.
Terebinthaceæ 156, 167, 173.
Terminalia 312.—T. alata 314, angustifolia 312, 814, Arjuna 314, Belerica 313, Benzoin 313, Berryi 314, Catappa 313, Chebula 313, citrina 313, coriacea 315, crenulata 314, cuneata 314, elliptica 314, glabra 314, intermedia 313, Moluccana 313, monaptera 315, Myrobalana 313, Myrobalanus-citrina 313, obovata 314, paniculata 315, punctata 313, reticulata 313, subcordata 313, tomentosa 314, Travancorensis 314.
Terminalieæ 312.
Ternstrœmia crenulata 86.
Ternstrœmiaceæ 85.
Tetracera 5.—T. Assa 5, Heyneana 5, lævis 5, Malabarica 5, Rheedei 5, trigyna 5.
Thalamifloræ 1.
Thalictrum 2.—T. glyphocarpum 2.
Theobroma 64.—T. Cacao 64.
Thespesia 54.—T. macrophylla 54, pupulnea 54.
Thlaspi Bursa 20, Bursa-pastoris 20.
Tiliaceæ 72.
Tiliacora racemosa 13.
Timoneus Forsteri 423.
Tina 113.
Tobinia 148.
Toddalia 149.—T. aculeata 149, Asiatica 149, bilocularis 149, floribunda 149, nitida 149, rubicaulis 149.
Tonsella 104.—T. prinoides 105.
Tordylium Anthriscus 374.
Torilis 374.—T. Anthriscus 374, elata 374.
Toxicodendron Cobbe 110.
Trapa 337.—T. bispinosa 337, quadrispinosa 337.
Trianthema 354.—T. crystallina 355, decandra 355, monogyna 355, obcordata 355, pentandra 355, polyantha 355, triquetra 355.
Tribulus 144.—T. lanuginosus 145, maximus 145.
Trichaurus 40.—T. ericoides 40.
Trichilia nervosa 120, spinosa 91, venosa 120, villosa 120.
Trichilieæ 118.
Trichosanthes 349.—T. Anguina 250, caudata 349, cordata 349, 350, cucumerina 350, cuspidata 349, globosa 349, heteroclita 349, Kakidonda 450, laciniosa 350, lobata 350, nervifolia 349, palmata 349, 350, 353, tuberosa 349.
Trifolium Germanicum 196, Indicum 196, officinale 196, unifolium 198.
Trigonella 195.—T. corniculata 196, elatior 196, esculenta 196, Fœnum-græcum 195, Indica 195, tetrapetala 197.

Digitized by Google

Trigonis 113.
Triguera acerifolia 55.
Trionum 48.
Triopteris Indica 108.
Triosteum hirsutum 390.
Triphasia 90, 91.—T. Aurantiola 91, sarmentosa 91, trifoliata 91.
Triplectrum 324.—T. radicans 324.
Tritheca 305.
Triumfetta 73.—T. angulata 74, Bartramia 75, glabra 75, glandulosa 74, Indica 74, Lappula 74, microphylla 75, neglecta 75, oblonga 74, oblongata 74, orbiculata 75, pilosa 74, rotundifolia 75, suborbiculata 75, trichoclada 74, vestita 74.
Turpinia 156.—T. microcarpa 156, Nepalensis 156, pomifera 175.
Turræa 116.—T. alata 137, virens 99.
Tytonia 140.—T. natans 449.

Umbelliferæ 365.
Unguicularia 250.
Unona 9.—U. altissima 446, Cananga 8, Chinensis 9, discolor 8, esculenta 10, grandiflora 9, Lessertiana 9, longifolia 10, macrophylla 9, moniliformis 446, Musaria 9, Narum 9, odorata 8, odoratissima 446, Selanica 88, uncinata 10.
Uraria 220, 221,—U. campanulata 222, comosa 222, crinita 222, desmodioides 222, hamosa 222, lagopoides 222, lanceolata 222, leptostachya 222, picta 221, retrofracta 223, retusa 222, styracifolia 222.
Urena 46.—U. Americana 47, cana 46, heterophylla 47, Lappago 47, lobata 46, 447, morifolia 47, muricata 47, paradoxa 47, repanda 46, scabriuscula 46, sinuata 46, 47.
Urticaceæ 161.
Uvaria 7.—U. cerasoides 10, ciliata 10, coriacea 8, esculenta 10, grandiflora 9, Heyneana 8, longifolia 10, lutea 8, mollis 9, monilifera 9, Narum 9, odorata 8, 446, odoratissima 10, purpurea 9, Russellii 9, suberosa 10, tomentosa 8, uncata 10, Zeylanica 9.

Vachellia 262.—V. Farnesiana 272.
Vahlia 364.—V. oldenlandiæ 364, oldenlandioides 364, sessiliflora 364, viscosa 364.
Valeriana 443.—V. Brunoniana 443, dioica 444, Hookeriana 444, Leschenaultii 444.
Valerianeæ 443.
Valikaha 319.
Valli-Modagam 107.
Vananga chinensis 421, edulis 421.
Vangueria Commersonii 421, cymosa 421, edulis 421, Madagascariensis 421, spinosa 421.
Vareca Molluccana 30.
Vateria 83.—V. Indica 83, lanceolata 84.
Vatica 84.—V. Chinensis 84, laccifera 84, Tumbugaia 84.
Velaga globosa 308, xylocarpa 69.
Ventilago 164.—V. bracteata 164, denticulata 164, Maderaspatana 164.
Verea 360.—V. laciniata 360, pinnata 360.
Viburnum 388.—V. acuminatum 388, capitellatum 388, hebanthum 388, pubigerum 389, Wightianum 388, 429.
Vicia Mitchelii 236.
Viciæ 235.
Viola 31.—V. cæspitosa 32, Chinensis 32, enneasperma 33, erecta 33, frutescens 33, Mysurensis 32, Notoniana 32, odorata 32, ovata 32, Patrini 32, primulæfolia 32, suffruticosa 33, 4447, Wightiana 32.

Digitized by Google

Violarieæ 31.
Virgilia 179.—V. aurea 179, Capensis 169, intrusa 179, lutea 179, sylvatica 179.
Viscum 378.—V. album 379, angulatum 380, attenuatum 380, Benghalense 379, capitellatum 380, confertum 379, cruciatum 379, dichotomum 381, falcatum 379, grossum 380, Heyneanum 379, Mangiferæ 380, moniliforme 380, monoicum 379, opuntioides 380, 381, orientale 379, ramosissimum 380, Tænioides 381, vertuculosum 379, Wallichianum 379, Wightianum 380.
Visenia concatenata 66, corchorifolia 66, supina 66.
Vitex lævigata 433.
Vitis 124.—V. adnata 126, angustifolia 128, aquosa 131, auriculata 127, 129, barbata 131, carnosa 127, 129, cinnamomea 131, cordata 126, cordifolia 131, crenata 127, cymosa 129, diversifolia 125, elongata 128, 129, erioclada 130, glaberrima 125, glabrata 130, glauca 125, 126, heterophylla 127, Heyneana 125, 131, inæqualis 125, Indica 130, 131, Kleinii 126, 130, lanata 131, lanceolaria 128, 353, latifolia 130, 131, Linnæi 125, 126, muricata 128, pallida 125, paniculata 129, pedata 128, quadrangularis 125, repanda 125, repens 125, 126, Rheedei 127, Roxburghii 127, rugosa 131, serratifolia 128, serrulata 129, setosa 127, tenuifolia 129, ternata 130, 131, tomentosa 130, 131, 448, trifida 130, triloba 130, 131, vinifera 139, Wightiana 125.
Vitmannia 151, 166.—V. Africana 166, elliptica 151.

Wahlenbergia 405.—W. perotifolia 405.
Walkera serrata 153.
Wallichia 71.
Walsura 120.—W. lanceolata 119, piscidia 120, robusta 120, ternata 120.
Waltheria 66.—W. Americana 67, angustifolia 67, corchorifolia 67, elliptica 67, erioclada 67, ferruginea 67, glabra 67, glabriuscula 67, gracilis 67, Indica 67, lanata 67, microphylla 67, ovata 67.
Webera 401.—W. cerifera 401, corymbosa 401, 429, cymosa 425, tetrandra 426, thyrsoidea 403.
Wendlandia 401, 402, 404.—W. bicuspidata 403, buddleioides 402, cinerea 402, 403, densiflora 403, exserta 402, 403, glabrata 403, Heyneana 403, Lawsoniæ 406, longifolia 402, Notoniana 403, paniculata 402, pendula 402, puberula 402, tinctoria 402, Wallichii 402, Wightiana 404.
Westonia humifusa 195.
Willemetia 166.—W. Africana 166.
Winterlia uliginosa 306.
Woodfordia 307.
Wormia 106.—W. Coromandeliana 5, dentata 5, triquetra 5.

Xanthochymus 101, 448.—X. ovalifolius 102, 448, pictorius 102, spicatus 102.
Xanthophyllum 39.—X. flavescens 39.
Ximenia 88, 89.—X. Americana 89, olacioides 89, Russeliana 89.
Xylocarpus 121.—X. Antila 120, Granatum 121.

Zaleya decandra 355.
Zanonia 340.—Z. Indica 340.
Zanthoxylaceæ 147.
Zanthoxyleæ 147.
Zanthoxyli facie 149.
Zanthoxylon 147.—Z. Budrunga 148, connaroides 148, Rhetsa 148, tetraspermum 148, triphyllum 148, Zeylanicum 148.
Zizyphus 161, 163, 399.—Z. Caracutta 162, elliptica 162, glabrata 161, 162, 163, horrida 163, Jujuba 161, 162, latifolia 162, microphylla 162, Mauritiana 162, Napeca 163, Nummularia 161, 162, obliqua 162, Œnoplia 161,

Digitized by Google

163, orbicularis 162, paniculata 162, rotundifolia 162, rugosa 161, 162, ruminata 162, scandens 163, Sinensis 163, Sororia 162, trinervia 162, vulgaris 163, xylopyrus 161, 162.
Zornia 217.—Z. angustifolia 217, conjugata 217, disperma 218, pulchella 230, reticulata 117, strobulifera 243, Zeylanica 217, Zeylonensis 217.
Zygophylleæ 144.
Zygophyllum Fabago 144.

END OF VOLUME FIRST.

PRINTED BY NEILL & COMPANY, OLD FISHMARKET, EDINBURGH.

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google